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Report to Congress

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Endangered and Threatened Species Recovery Program

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MARCH 3, 1849

THE SECRETARY OF THE INTERIOR
WASHINGTON

ENDANGERED SPECIES ACT

Report of the Department of the Interior

FOREWORD

This Report to Congress, the second one prepared to comply with a requirement of the 1988 amendments to the Endangered Species Act, represents an accounting of the recovery progress for all federally listed endangered and threatened species under the jurisdiction of the Department of the Interior occurring in the United States and Trust Territories as of September 30, 1992. The report contains information on the status of recovery plan development, the status of all listed species in the United States, a State-by-State breakdown of listed species, and selected species highlights by State. The report also highlights partnerships forged between Federal agencies, State and local governments, various private entities, and volunteers to promote the recovery of species and the ecosystems upon which they depend.

The Endangered Species Act, passed by Congress in 1973, established a strong leadership role for the Federal Government in the conservation of species at risk of extinction. Congress envisioned a network of international, national, State, and private organizations working together toward common goals. It was made clear that the people of the United States were to act together as a team to conserve not only individual species, but their habitats as well.

While there are many successes detailed in this report, much work remains to be done. Ultimately, recovery of listed species must be a partnership aimed at the conservation of the diversity of plant and animal life in the United States. Maintenance of such biological diversity, or biodiversity, will require the careful management of habitat systems in the context of ongoing human use. Our national biodiversity resources will be conserved most effectively by means that recognize the interrelations of natural systems and look at the whole picture, which is far more than the sum of individual parts. It is right to deal with crises involving individual species, but we should not manage our lands and resources so that we either consciously or unwittingly produce, and then must react to, an endless progression of crises.

At the Department of the Interior, we are beginning to explore the ways that existing authorities may be used to prevent the degradation of ecosystems, which ultimately leads to endangered species listings and "last resort" recovery planning. The Department of the Interior is committed to increasing its emphasis on biodiversity and ecosystem conservation, and will be making greater efforts to promote the partnerships essential for accomplishment of the important challenges facing us.

Report to Congress

Endangered and Threatened Species Recovery Program

Prepared by
U.S. Department of the Interior
U.S. Fish and Wildlife Service
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Executive Summary

Purpose

On October 7, 1988, President Reagan signed into law a bill amending the Endangered Species Act and authorizing increased appropriations to implement the Act through fiscal year 1992 (Public Law 100-478). One of the major amendments made more specific the general requirement that the Secretaries of the Interior and Commerce develop and implement recovery plans.

The amendment further directs the Secretaries to report every 2 years on the status of efforts to develop and implement recovery plans for all listed species and on the status of all species for which recovery plans have been developed. This report is the second Report to Congress on the status of the recovery program for federally listed endangered and threatened species under the Secretary of the Interior's jurisdiction.

Background

Recovery is the cornerstone and ultimate purpose of the endangered species program. Recovery is the process by which the decline of an endangered or threatened species is arrested or reversed, and threats to its survival are neutralized, so that its long-term survival in nature can be ensured. The goal of this process is to restore listed species to a point where they are secure, self-sustaining components of their ecosystem so as to allow delisting. The Secretary of the Interior has delegated responsibility for endangered species recovery to the Fish and Wildlife Service (Service).

The primary objectives of the Service's recovery program are to: (1) identify those ecosystems and organisms that face the highest degree of threat, (2) determine tasks necessary to reduce or eliminate the threats, (3) apply the resources available to the highest priority recovery tasks, and (4) reclassify and delist species as appropriate.

The Service will continue to emphasize conservation of species through a multi-species or ecosystem approach. More and more the Service is recognizing that concentration on conserving individual species from extinction is inadequate when other interdependent species that are members of the same ecosystem continue to decline. The Service is directing increased attention to producing multi-species or ecosystem recovery plans that address the needs of other species that are not primary targets of the plan.

A major commitment of time and resources is often needed to stabilize populations and begin to reverse the downward trend of species. Although the endangered species recovery program is relatively new with respect to the time involved in turning around a species' decline, many success stories can be told. Primary recovery efforts generally aim at stabilizing or reversing deterioration of a species' habitat or decline in its numbers and then restoring it to a condition in which it is likely to survive over the long-term. Delisting is the ultimate goal of the recovery program.

Successes of the recovery program, whether they be reclassifications, delistings, or significant steps toward achieving species recovery objectives, have been many. Highlights of some of these successes are included in the report.

Results

Of the 728 U.S. listed species as of September 30, 1992, 711 are under the jurisdiction of the Fish and Wildlife Service. Of the 711 species, 170 have been listed for less than 3 years. Species listed in the last 3 years have been dominated by plants (79 percent). For the most part, species listed less than 3 years do not yet have approved recovery plans. Many do, however, have plans in some stage of development.

Of the 711 species, 410 (58 percent) had approved recovery plans as of September 30, 1992, while 468 (66 percent) had either an approved recovery plan or one that was in draft (i.e., Technical or Agency Draft plans). Of the remaining 301 species without recovery plans, 170 have been listed for less than 3 years and recovery plans are under development. Furthermore, 15 species (2 percent) will not have plans developed for the reasons indicated in the report. That leaves 116 species listed longer than 3 years that do not yet have approved recovery plans. The Service has developed a plan to reduce this backlog of species without recovery plans by the end of FY 1996.

Even though species are afforded protection under the Endangered Species Act, the status of a number of those species is still critical. Ten percent are considered improving and 28 percent are considered stable as a direct result of recovery efforts, but a sizeable number (33 percent) are still considered declining and 2 percent are believed extinct. Due to budgetary and staffing constraints, the status of 27 percent of the listed species is unknown; further research and survey work are needed to determine each "unknown" species' overall status.

Introduction

The Endangered Species Act (Act) is one of the most comprehensive pieces of environmental legislation ever enacted by Congress. Fiscal year (FY) 1993, the 20-year anniversary of the Act, coincides with profound Congressional and public interest on the Act's forthcoming reauthorization and wide-ranging debate over its purposes, effects, and accomplishments. The Act calls for the conservation of threatened and endangered species and of the ecosystems upon which they depend. The Fish and Wildlife Service's (Service) responsibilities under the Act fall into a hierarchy of activities from mandatory to discretionary: consultation, listing, recovery (planning and implementation), permitting, and prelisting.

Between the end of FY 1990 and FY 1992, the total number of species listed in the United States and abroad increased from 1,116 to 1,258 species. Associated with this increase in listed species was an increase in the Service's workload of section 7 consultations, recovery planning, and recovery implementation. The number of species identified as candidates for listing under the Act has increased over time to more than 3,000.

As the challenges of the endangered species program have increased, so have the successes. The American bald eagle is making a remarkable comeback, the American alligator no longer requires Endangered Species Act protection, and the Aleutian Canada goose was recently reclassified from endangered to the less critical threatened category because of dramatic population increases over the years. These are just a few of the recent and highly publicized endangered species success stories.

But lesser known are the hundreds of endangered and threatened species of plants, snails, butterflies, fishes, mussels, and other wildlife appearing on the pages of the Lists of Endangered and Threatened Wildlife and Plants. Some are benefitting greatly from protection under the Endangered Species Act while others are still struggling.

This Report to Congress represents an accounting of the recovery progress for all 711 federally listed endangered and threatened species under the jurisdiction of the Fish and Wildlife Service occurring in the United States and Trust Territories as of September 30, 1992. While some of the species covered in this report are found in both the United States and foreign countries, those found only in foreign countries are not included because the Service has no authority to implement recovery programs for species outside U.S. jurisdiction. Specifically, the report contains information on the status of recovery plan development, the status of all listed species in the U.S., a State-by-State breakdown of listed species, and selected species highlights by State. The selected species highlights summarize species status, recovery achievements, recovery needs, and partnerships, from well-known species such as the black-footed ferret to lesser known ones such as the Navasota ladies'-tresses. The highlights summarize some of the notable achievements that have been made in endangered and threatened species recovery.

This report is a requirement of the 1988 amendments to the Endangered Species Act and will be prepared every 2 years. The report does not address species under the jurisdiction of the U.S. Department of Commerce, National Marine Fisheries Service.

Recovery Program Status

Overview

When Congress passed the Endangered Species Act [16 U.S.C. 1531 et. seq.] in 1973, it set clear public policy that the people of the United States were to act to prevent the destruction of nature's resource diversity. The Act established a strong leadership role for the Federal Government in the conservation of species at risk of extinction. Congress envisioned a network of international, national, State, and private organizations working together toward common goals.

The Act was passed to provide a means to conserve the ecosystems upon which endangered and threatened species depend and to provide a program for the conservation of these species. "Conserve" was defined as the use of "all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary…." The Act further declared that the policy of Congress is for all Federal departments and agencies to seek to conserve endangered and threatened species and that they shall use their own authorities in furtherance of the purposes of the Act. Read in conjunction with the statutory definition of "conserve," Congress made it clear that all Federal agencies should promote the recovery of listed species.

Pacific Gas and Electric

Fish and Wildlife Service employees and volunteers plant endangered Contra Costa wallflowers, endangered Antioch Dunes evening-primroses, and naked buckwheat at the Antioch Dunes National Wildlife Refuge in California to restore habitat for the endangered Lange's metalmark butterfly.

On October 7, 1988, President Reagan signed into law a bill amending the Endangered Species Act and authorizing increased appropriations to implement the Act through FY 1992 (Public Law 100-478). One of the major amendments made more specific the general requirement that the Secretaries of the Interior and Commerce develop and implement recovery plans. The amendment further directs the Secretaries to report every 2 years on the status of efforts to develop and implement recovery plans for all listed species and on the status of all species for which recovery plans have been developed.

Recovery is the cornerstone and ultimate purpose of the endangered species program. Recovery is the process by which the decline of an endangered or threatened species is arrested or reversed, and threats to its survival are neutralized, so that its long-term survival in nature can be ensured. The goal of this process is to restore listed species to a point where they are secure, self-sustaining components of their ecosystem so as to allow delisting. The Secretary of the Interior has delegated responsibility for endangered and threatened species recovery to the Fish and Wildlife Service.

The primary objectives of the Service's recovery program are to: (1) identify those ecosystems and organisms that face the highest degree of threat, (2) determine tasks necessary to reduce or eliminate the threats, (3) apply the resources available to the highest priority recovery tasks, and (4) reclassify and delist species as appropriate.

This report is the second Report to Congress on the status of the recovery program for federally listed endangered and threatened species under the Secretary of the Interior's jurisdiction. This second Report to Congress differs from the 1990 report in a few ways. In the 1990 report, the status of species was provided only for those with recovery plans; this report provides the status of all listed species in the United States. The 1990 report provided summaries of current and planned recovery activities for all federally protected U.S. species under the Service's jurisdiction. This report provides selected species highlights by State for those species for which notable recovery achievements have been made.

Recovery Policy

The Act calls for the conservation of threatened and endangered species and of the ecosystems upon which they depend, ultimately, to recover listed species to levels where protection under the Act is no longer required. The first step in the recovery process is the collection of necessary biological information, the development of species-specific recovery goals, and the formulation of management needs in terms of their relative importance and timing for recovery. This information establishes the basis of a recovery plan, which serves as the blueprint for private, Federal, and State cooperation in the development and implementation of recovery actions. The recovery planning process provides for public participation to enhance coordination and acceptance, which are vital to species' survival and eventual recovery.

The second step in recovery of a species is implementation of recovery actions. Coordination among Federal, State, and local agencies, academic researchers, conservation organizations, private individuals, and major land users is perhaps the key ingredient for implementation of an effective recovery program. In its role as coordinator of the recovery process, the Service emphasizes cooperation and teamwork among all involved parties to achieve the common goal of species' recovery.

To promote efficiency, the Director of the Service has delegated responsibility for recovery of listed species to the Regional Directors. Each listed species is the responsibility of at least one Region, known as the lead Region. Decisions involving species that cross regional boundaries are coordinated by the lead Region among the other appropriate Regions. Regional Directors have the responsibility to determine if a recovery plan is needed, ensure that a recovery plan is developed as appropriate, and direct implementation of the recovery plan.

Recovery Planning

Section 4(f) of the Act, as amended, calls for the development and implementation of recovery plans for species of animals and plants listed as endangered or threatened unless such plans will not promote their conservation. Recovery planning provides several benefits when completed in a timely and thorough manner. By developing recovery plans with broad public involvement, many of those most affected by recovery actions will gain a better understanding of what it will take to fully recover a species. This can reduce and oftentimes eliminate foreseeable human use conflicts with listed species and their habitats. Recovery actions identified in the recovery plans can be recommended or required through the Act's section 7 consultation process. Thus, a recovery plan enables many land managers, both governmental and non-governmental, to plan future actions with more certainty.

To the maximum extent feasible, a recovery plan must identify management tasks, recommend research needs, and list other actions that may be necessary to achieve the plan's goal for the conservation and survival of the species. The plans must develop precise, measurable criteria to objectively determine when recovery has been achieved. Recovery planning may be done in-house or involve outside assistance, such as a multi-member recovery team composed of individuals from other Federal agencies, State personnel, or private contractors. All outside work is reviewed by the Service, and the Service maintains oversight and reserves the right to modify the draft plan as necessary to ensure consistency among plans, resolve disputes among recovery team members, and determine task priorities.

Recovery plans estimate the timeframe required for accomplishing recovery with the assumption that sufficient funds will be available and that cooperation will be forthcoming from all involved parties. In addition, an attempt is made to estimate the cost of complete recovery. It is acknowledged in each recovery plan that such estimates are imprecise, given the uncertainty surrounding the needs of many species and the availability of resources for agencies to accomplish assigned tasks.

The public is given the opportunity to review and comment on draft recovery plans. The Service publishes notices in the *Federal Register* announcing the availability of draft plans, and public comment is solicited. Generally, the public is given 30 to 60 days to comment; however, comments are accepted at any time during recovery plan preparation. In some cases, press releases are issued and public meetings held. All comments are reviewed and addressed in the final plan to the extent possible. Under Department of the Interior procedures, the development and approval phases of recovery plans are excluded from National Environmental Policy Act (NEPA) documentation requirements because they are advisory in nature.

Management tasks identified in the plans are subject to NEPA and other applicable laws and regulations if they are proposed for implementation. In these cases, public involvement would be sought through the development of Environmental Assessments or Environmental Impact Statements.

It is Service policy to prepare a recovery outline within 60 days of listing a species, a draft plan within 1 year of listing, and a final plan within 2.5 years of the date of listing. Recovery outlines are used as a guide for recovery until an official plan is developed. During FY 1992, the Service completed draft plans for 47 species and final plans for 41 species. Concurrently, the Service reviews and revises recovery plans as necessary.

Over 100 species have been on the list longer than 2.5 years and still lack approved recovery plans. These species are considered the recovery plan "backlog." Beginning in FY 1993, the Service plans to eliminate this backlog within 4 years while keeping up with the anticipated accelerated listing rate associated with an out-of-court settlement in *Fund for Animals v. Lujan*. Under this settlement, over 400 candidates for listing, mostly plants, will either be proposed for listing or removed from or reassigned on the candidate list by the end of FY 1996.

The following recovery planning targets, which reflect the number of species for which recovery plans will be developed, have been generated by the Service to eliminate the backlog while maintaining timely recovery planning efforts:

Fiscal Year	*Draft Plans*	*Final Plans*	*Total Plans*
1993	120	73	193
1994	163	120	283
1995	168	163	331
1996	127	168	295

These annual targets represent an approximate 210 percent increase over the FY 1992 recovery plan development totals. In addition, approximately 260 of the existing plans (covering 348 species) will require review and possible revision over the next few years.

While the Service is thoroughly committed to recovery planning, not all species will have recovery plans associated with their management. Some listed species, such as the Little Kern golden trout, already have recovery objectives outlined in State management plans that, in effect, double as a recovery plan. The Service uses these plans in lieu of actual recovery plans. Other species, such as Bachman's warbler and Scioto madtom, are believed to be extinct; therefore, until representatives of these species are found in the wild, recovery plan preparation is deferred. In the interim, the Service continues to solicit information relative to the status of these species.

Recovery Implementation

To appropriately use available resources, the Service has designed a two-tiered priority system to guide species recovery. The first component is *recovery priority*. This numerical system assigns species a rank of 1 to 18 according to the degree of threat, recovery potential, taxonomic distinctness, and presence of an actual or imminent conflict between the species' conservation and development or other economic activities. Each species is assigned a recovery priority by the lead Region at the time of listing, which is reviewed annually thereafter. The second component is the *recovery task priority*. In developing a recovery plan, recovery tasks are assigned numerical priorities of 1, 2, or 3 according to the relative contribution they may make to species recovery.

FWS File Photo

A Texas A & M University graduate student weighs a female Concho water snake as part of a study to determine information on the general ecology of this threatened species.

In concept, resources should be allocated first to accomplish priority-1 recovery tasks for species with a recovery priority number of 1 and last to priority-3 tasks for a species with a recovery priority of 18. Actual funding allocations, however, may not follow this guideline strictly in all cases. Some otherwise low priority species that need only one or two low priority tasks to complete recovery might receive resources to expedite their reclassification or delisting.

Thus, given existing resources within the Service, the primary focus of recovery implementation activities is often placed on addressing "threshold" species. Threshold species are those that, due to current situations, are about to go extinct or those that are close to recovery. Whenever a species is approaching the irreversible point of extinction, the Service must respond in an immediate, effective manner to prevent such an undesired consequence. On the other hand, the Service believes it is important to provide the necessary technical and monetary support to boost a species to full recovery when it identifies a species that is close to reaching this goal.

The tools of recovery are numerous, and their utility varies from species to species. Tools may include reintroductions of species into formerly occupied habitat (designation of a population to be reintroduced as "experimental" under section 10(j) of the Act), land acquisition, captive propagation, habitat protection, research, and public and landowner education. Depending on the significance and effect on the environment, a particular recovery action may involve the National Environmental Policy Act. In these cases, an Environmental Assessment or Environmental Impact Statement will be done, and the public given the opportunity to comment.

Frequently, the Service is criticized for the perceived slow rate at which recovery plans are implemented. The public often believes that implementation of recovery tasks identified in recovery plans is the sole responsibility of the Service. This was not the intent of Congress nor is it possible given the Service's resources. Although Congress did envision a strong leadership role for the Fish and Wildlife Service in recovery of listed species, it also recognized the roles that other Federal agencies, States, and private citizens could and should play.

The Service actively works to develop partnerships that promote recovery at the Federal, State, and local levels. Many of the species highlights found later in this report would not have been possible without the help of partners. It is the Service's goal to continue to promote partnerships, especially at the State level.

While many firm partnerships have been forged, the Service recognizes that there is room for improvement. According to the data compiled in the FY 1991 Federal and State Endangered Species Expenditures Report, approximately 10 percent of all listed species had no readily identifiable expenditures reported from any State or Federal source.

Over the last 2 years, the Service has expanded its efforts to educate other Federal agencies of their responsibilities related to recovery. For example, section 7(a)(1) of the Endangered Species Act clearly identifies the role of other Federal agencies in the recovery process by directing them to use their existing authorities to promote the conservation of listed species. Under existing authorities granted to Federal agencies through other acts, such as National Forest Management Act of 1976 [16 U.S.C.A. 1601-1614], Multiple-Use Sustained Yield Act [16 U.S.C.A. 528-531], Federal Water Pollution Control Act Amendments of 1972 (i.e., the Clean Water Act) [22 U.S.C. 1251 et seq.], and the Federal Land Policy and Management Act [43 U.S.C. 1701 et seq.], Federal agencies can and do have a vital role to play in the conservation of candidate and listed species.

Ecosystem Approach to Recovery

Often it is not recognized that the Endangered Species Act is ecosystem and habitat oriented. However, major sections of the Act focus on the conservation of ecosystems upon which endangered and threatened species depend. As human population and consumption accelerates the fragmentation, alteration, and degradation of native ecosystems, our endemic species require more thoughtful and often intensive management. Consideration of ecosystem integrity in prelisting, listing, and recovery activities is of utmost importance in actually helping to conserve ecosystems and the diversity they provide.

Recognizing that several listed species may share geographic locations and/or face common threats, the Service seeks opportunities to combine several listed, proposed, and/or candidate species in one recovery plan. This approach, known as the "multi-species" or "ecosystem" approach, can improve the rate, fiscal efficiency, and effectiveness of recovery planning and implementation for listed species and may obviate the need to list candidate species.

Some examples of ecosystem-based recovery plans that have been prepared to address multiple listed species' recovery needs in a single ecosystem follow:

- Ash Meadows Recovery Plan—4 fishes, 1 insect, and 7 plants on the border of Nevada and California
- Maui-Molokai Forest Birds Plan—7 birds in Hawaii
- California Channel Island Species Plan—4 plants, 2 birds, and 1 reptile in California
- Florida Scrub Plants Plan—11 plants in central Florida
- Pine-rockland Ecosystem Plan—5 plants in south Florida
- San Marcos River Ecosystem Plan—2 fishes, 1 amphibian, and 1 plant in Texas

The Service will continue to emphasize conservation of species through a multi-species or ecosystem approach. More and more the Service is recognizing that concentration on conserving individual species from extinction is inadequate when other interdependent species that are members of the same ecosystem continue to decline. The Service is directing increased attention to producing multi-species or ecosystem recovery plans that address the needs of other species that are not primary targets of the plan.

Recovery and Biodiversity

Biodiversity is conserved by preserving the integrity of landscape, ecosystems, and habitats to ensure species conservation. The goal of the Endangered Species Act is the conservation of unique life-forms and the natural systems upon which they depend. An evaluation of the Act's effectiveness should focus on the degree to which species and populations of organisms and the ecological relationships that connect and support them, collectively referred to as biodiversity, are being maintained or degraded. Much attention has been focused in recent years on the need to better understand and protect the planet's biodiversity; endangered species, as non-regenerable elements of this system, are an essential ingredient in any program directed at biodiversity conservation.

The loss of genetic diversity is of great concern to the Fish and Wildlife Service. Too often we find that by the time a species is threatened with extinction, so much genetic diversity has been lost that herculean efforts and expenditures are needed to attempt to save the species. In addition, the loss of genetic diversity poses grave implications for humans (e.g., genetic diversity is playing an increasingly important role in the search for disease resistant agricultural crops and new medicines).

John Harrell

Fish and Wildlife Service biologists track radio-tagged Colorado squawfish to evaluate life history and habitat requirements and determine population status and trends of the species.

Between FY 1991 and FY 1992, the Service's endangered species budget grew by approximately 25 percent, allowing the Service to increase proactive efforts to address biodiversity through planning, habitat protection and restoration, and monitoring. While the Endangered Species Act serves as a safety net to help prevent extinctions and avoidable loss of the planet's biodiversity, the conservation of biodiversity ultimately depends on the stewardship of all species under the leadership of the States and the Federal government in partnership with private landowners. Such partnerships are essential in balancing the needs of wildlife and plant conservation with natural resource development. This alliance, if properly developed, could minimize the need to list species under the Endangered Species Act, since the threats to their continued existence will have been avoided at the earliest possible stages.

Endangered Species Recovery Appropriations

Funding authorizations by Congress to support the Service's recovery program have increased since the 1988 amendments. Funds enacted for FY 1991 and FY 1992 along with designated Full-Time Equivalent (FTE) positions are shown below.

Subactivity	*FY 1991 ($/FTEs)*	*FY 1992 ($/FTEs)*
Listing	4,325,000/66	7,467,000/100
Consultation	5,267,000/93	8,131,000/127
Permits	910,000/24	1,199,000/25
Recovery	14,875,000/130	18,924,000/164
Law Enforcement	8,811,000/161	10,340,000/160
Fisheries	163,000/3	163,000/3
Research	7,577,000/75	7,845,000/80
Grants to States	6,674,000/0	6,620,000/8
Total	48,602,000/552	60,689,000/667

In FY 1991 and FY 1992, recovery represented approximately 31 percent of the Service's total endangered species budget. Specific recovery activities either directed by Congress or earmarked by the Fish and Wildlife Service included:

Fiscal Year 1991

$ 110,000	Kirtland's warbler
$ 410,000	Grizzly bear
$ 567,000	Peregrine falcon
$ 497,000	California condor
$ 563,000	Sea turtles
$ 386,000	Southern sea otter
$ 75,000	Hawaiian birds
$ 730,000	Rocky Mountain wolf (Animal Damage Control included)
$ 795,000	Puerto Rican parrot
$ 237,000	Cui-ui
$ 457,000	Whooping crane
$ 260,000	Black-footed ferret
$ 1,118,000	Plants
$ 149,000	Florida panther
$ 229,000	West Indian manatee
$ 395,000	Aleutian Canada goose
$ 574,000	Bruneau hot springsnail
$ 1,844,000	Northern spotted owl
$ 209,000	Desert tortoise
$ 665,000	Red wolf
$ 624,000	Upper Colorado River fishes
$ 300,000	Hawaiian species
$11,194,000	**Total Earmarks and Directives**

Total FY 1991 Recovery Appropriation = $14,875,000

Fiscal Year 1992

$ 77,000	Kirtland's warbler
$ 590,000	Grizzly bear
$ 607,000	Peregrine falcon
$ 606,000	California condor
$ 563,000	Sea turtles
$ 339,000	Southern sea otter
$ 255,000	Hawaiian birds
$ 849,000	Rocky Mountain wolf (Animal Damage Control included)
$ 680,000	Puerto Rican parrot
$ 143,000	Cui-ui
$ 460,000	Whooping crane
$ 280,000	Black-footed ferret
$ 1,003,000	Plants
$ 74,000	Florida panther
$ 281,000	West Indian manatee
$ 395,000	Aleutian Canada goose
$ 132,000	Bruneau hot springsnail
$ 2,754,000	Northern spotted owl
$ 286,000	Desert tortoise
$ 665,000	Red wolf
$ 624,000	Upper Colorado River fishes
$ 395,000	Pacific Islands
$12,058,000	**Total Earmarks and Directives**

Total FY 1992 Recovery Appropriation = $18,924,000

These directives and earmarks represented 75 percent and 64 percent of the total recovery appropriation in FY 1991 and FY 1992, respectively.

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Dr. Karen L. Eckert and an Earthwatch volunteer measure a nesting leatherback sea turtle at Sandy Point National Wildlife Refuge in the U.S. Virgin Islands.

Recovery Successes

As mentioned earlier, the purposes of the Endangered Species Act are to provide a means to conserve the ecosystems upon which endangered and threatened species depend and to provide a program for the conservation of these species. Unfortunately, by the time species are listed and the protections of the Act are in place, they often have declined to such an extent that major efforts are needed just to prevent extinction, and the ecosystems upon which they depend have been so degraded that their ability to support a diverse assemblage of species is in question.

A major commitment of time and resources is often needed to stabilize populations and begin to reverse the downward trend of species. Although the endangered species recovery program is relatively new with respect to the time involved in turning around a species' decline, many success stories can be told. Primary recovery efforts generally aim at stabilizing or reversing deterioration of a species' habitat or decline in its numbers and then restoring it to a condition in which it is likely to survive over the long-term. Delisting is the ultimate goal of the recovery program.

A short-term measure of the Service's recovery efforts to date is the proportion of listed species whose status has been stabilized, particularly among species that are habitat-limited and thus more vulnerable to changes in their environment. Maintenance of remaining populations of listed species and prevention of their extinction is basic to the recovery program.

Successes of the recovery program, whether they be reclassifications, delistings, or significant steps toward achieving species recovery objectives, have been many. Highlights of some of these successes are included below and in the selected species highlights presented later in the report.

Aleutian Canada goose

This subspecies was once widespread throughout the Aleutian chain in Alaska and the Bering Sea. It suffered a drastic decline when commercial fox farmers introduced non-native foxes onto the islands from about 1836 to about 1930. The geese were easy prey. Hunting and loss of wintering habitat also may have contributed to the decline of the Aleutian Canada goose. Only 200 to 300 geese were thought to remain by the time the species was listed as endangered in 1967. Originally, nesting was believed restricted to a single small island, Buldir Island, but additional remnant populations were subsequently found. Eliminating foxes from the islands and relocating wild family groups of geese from Buldir resulted in successful reestablishment on additional islands with natural reestablishment on other islands. On the wintering grounds, a major effort was undertaken to protect the wintering flocks from hunting and to preserve roosting and feeding habitat. Several key staging and wintering habitats in Oregon and California have been protected through easements and inclusion within the National Wildlife Refuge System. Other important areas have been acquired by the California State Wildlife Area and Park systems. As a result of the recovery efforts on both the breeding and wintering grounds, the Aleutian Canada goose population has increased in the wild from fewer than 800 birds in 1975 to approximately 7,900 during winter 1991/1992. Recent surveys indicate that the goose now nests on nine islands in the Aleutian chain, up from three at the start of recovery efforts. As a result of recovery efforts, the Aleutian Canada goose was reclassified from endangered to threatened in 1990.

David A. Jett

As part of a study to determine survival rates, dispersal patterns, age and sex ratios, and other information needed for long-term management of the Kirtland's warbler, a Fish and Wildlife Service biologist and an Ohio Cooperative Fish and Wildlife Research Unit graduate student examine and band a Kirtland's warbler on its breeding grounds in Michigan.

American alligator

Through law enforcement and State cooperation, recovery was achieved by controlling the illegal "taking" of alligators and managing commerce in meat and leather products. The species remains on the List of Endangered and Threatened Wildlife only because of its similarity of appearance to the listed American crocodile and other crocodilians subject to import. Because it is difficult to distinguish the parts and products of listed and non-listed crocodilian species, the American alligator remains on the list to ensure protection of listed crocodiles. In essence, owners of alligator parts must be able to prove that they do not own mislabeled or falsified crocodile parts. However, the alligator no longer receives the full protection of the Act.

American and Arctic peregrine falcons, bald eagle, and Eastern brown pelican

These three species benefitted from aggressive habitat management, protection during the breeding season and, most of all, from the banning of DDT. The chlorinated hydrocarbon pesticide DDT and its metabolic byproducts caused thinning of the eggshells and nest failures. The peregrine falcon also benefitted from a broad-based public involvement in the raising of falcons in captivity and their reintroduction to appropriate relatively DDT-free habitat. The 1992 production survey results for bald eagles in the lower 48 States reported good news for the eagle. In 1963, 417 occupied eagle territories were known to exist. Over the years that number has increased steadily, but even more significant is that the rate of increase has more than doubled in the last 20 years. In 1992, 3,747 occupied territories were reported. As a result of the banning of DDT and recovery efforts, the Atlantic Coast, Florida, and Alabama population of the brown pelican was delisted in 1985. Proposals to reclassify the bald eagle and American peregrine falcon from endangered to threatened status over a significant portion of their range and a proposal to delist the Arctic peregrine falcon are under consideration for publication in 1993.

Black-footed ferret

A long history of prairie dog control programs has reduced populations of this preferred prey of ferrets. Once thought to be extinct, the ferret was rediscovered in 1981 near Meeteetse, Wyoming. Canine distemper devastated that wild population in the late 1980s. A captive propagation program, founded by the 18 survivors of this population, has been extremely successful, resulting in a population of over 400 by mid-1992. In the fall of 1991, 49 juvenile ferrets were released in the Shirley Basin area of southeast Wyoming as part of a nonessential experimental population. The release was the result of considerable landowner cooperation. The landowners owned about 55 percent of the management area where the ferrets were released. A similar release is planned for the fall of 1992. The Service has confirmed at least four surviving ferrets and six young born in the wild from the 1991 release. Releases in South Dakota and Montana are being considered for FY 1993. Releases of captive bred ferrets will continue in other States as new sites are identified and releases are coordinated with involved agencies and landowners.

California condor

Environmental contaminants, conflicts with man, and specialized habitat requirements have brought the condor to the very brink of extinction over the past 200 to 300 years. In 1987, the last California condor was removed from the wild for captive breeding; at that time the total population was at a low of 27 birds. An aggressive captive breeding program increased their numbers to 64 birds in 1992. A surrogate species, the Andean condor, was used to study techniques for returning California condors to the wild. In January 1992, two California condors from the captive flock were released to the wild. Additional release efforts will continue as excess birds become available from the captive flock.

Furbish lousewort

A major educational effort on the Furbish lousewort after its listing as endangered in 1978 resulted in increased landowner contact and public awareness. Since then, a local Land Conservation Trust has been established, conservation easements on lousewort habitat are being pursued, local botanists have been hired to survey for the plant, and an enhanced conservation ethic is being observed.

Greenback cutthroat trout

Originally listed as endangered in 1967, the greenback cutthroat trout was reclassified as threatened in 1978. This native trout declined due to the introduction of nonnative rainbow, brook, and brown trout that outcompeted or hybridized with the greenback cutthroat trout in its native streams. At the time of its original listing, only two small historic populations were known to exist. Since then, the Service has restored the species in over 40 lakes and streams in and around Rocky Mountain National Park and other areas in Colorado. There is catch and release fishing for the species in 15 lakes, and a new captive broodstock is being established by the Colorado Division of Wildlife for future stocking. The species is nearing its recovery goals and, with continued reintroduction of the greenback cutthroat trout into its native streams and continued control of nonnative trout, the species might be delisted by the year 2000.

Peter's Mountain mallow

This plant occurs naturally at only one known spot on earth, Peter's Mountain in southwest Virginia. When the species was listed in 1986, only three individuals remained. The fruits were dropping off these plants before seeds were produced, and no new mallow plants were germinating. Botanists sifted through samples of leaf litter in search of viable seeds at the population site. Ninety-five seeds were found and research began on why these seeds were not germinating naturally. They found that the seeds had to be scarified in order to germinate. The botanists succeeded in producing many healthy plants that produced healthy fruits and thousands of seeds. This seed source allowed further study on the species, and the botanists determined that the original plants were not producing seeds because the species is not self-fruitful. Under natural conditions, seed coats were broken by light fires and, thus, fire suppression contributed to the species' endangerment. Listing of this plant led to the acquisition of its site which is now protected. Management tools, such as prescribed burning, will be used to further promote this species.

Red wolf

In the 1970s, at the very verge of extinction, the last remaining wild red wolves were captured. The species has been successfully raised in captivity through the cooperative efforts of the Service and the zoological community. With the help of The Nature Conservancy, land was acquired for establishment of the Alligator River National Wildlife Refuge in North Carolina where red wolves were first reintroduced in 1987. In 1991, red wolves also were reintroduced into the Great Smoky Mountains National Park. Some 100 wolves are now in captivity and at a minimum another 30 to 35 are free in the wild at the two reintroduction sites.

Whooping crane

From a low of 16 birds in 1941, the wild population now consists of over 150 cranes that summer in Canada and winter at the Aransas National Wildlife Refuge in Texas. Another dozen birds exist in a reintroduced flock that summers around Grays Lake National Wildlife Refuge, Idaho, and winters on or near the Bosque del Apache National Wildlife Refuge, New Mexico. In addition, efforts are under way to reintroduce a non-essential experimental population of whooping cranes into the Kissimmee Prairie in central Florida in FY 1993. The captive flocks at the Patuxent Wildlife Research Center in Maryland, International Crane Foundation in Wisconsin, and San Antonio Zoo in Texas now consist of about 90 birds.

These preceding highlights demonstrate that it is possible to reverse the road to extinction. These and many other species have clearly benefitted from protection under the Endangered Species Act.

Delistings and Reclassifications

The primary goal of the endangered species program is to ensure the survival of species and the habitats upon which they depend and to recover the species to the point at which protection under the Endangered Species Act is no longer warranted. Delisting (removing species from the Lists of Endangered and Threatened Wildlife and Plants) can occur for one of three reasons: 1) species extinction, 2) species recovery, or 3) original data for classification in error.

Delisting as a result of recovery is the culmination of an often long and arduous process involving planning to set the recovery objectives, implementation to address these objectives, and evaluation and monitoring of recovery implementation to ensure that all objectives have been met. Quality status surveys to determine population levels, recruitment levels, habitat quality, and whether recovery plan objectives have been met are usually required. Therefore, the amount of funding provided to the recovery program, particularly that used for implementation of approved recovery actions, is a key factor for a successful delisting program.

The delisting process follows the same procedure used to list species. A proposal is published in the *Federal Register*; public comment is invited and incorporated into the final decision, which is made within a year of the proposal. The proposed rule must specifically outline the level of monitoring anticipated for at least 5 years following delisting, and the parties, usually the States, responsible for this monitoring are named.

While the delisting of the American alligator and Atlantic Coast, Florida, and Alabama population of the brown pelican represent the ultimate measure of success of the Act, accomplishments such as the prevention of extinctions and significant declines in species' populations and their habitats represent noteworthy successes of the program as well. It is important to remember that the loss and degradation of habitat and the decline of species to a point near extinction often is a slow, gradual process, and, therefore, reversing that degradation and decline and moving toward recovery requires a long-term commitment. A concerted, coordinated effort to address a species' needs throughout its range is necessary. The Service is currently considering delisting or reclassifying from endangered to threatened status the species listed below. In some cases, the Service is in the process of conducting status surveys to determine the appropriateness of these actions; in other cases, the Service has already determined appropriateness and is preparing proposals to carry out delisting or reclassification.

Region	*Species*
1	American peregrine falcon (reclassification)
	Columbian white-tailed deer (reclassification)
	Cuneate bidens (delisting)
	Hawaiian hawk (reclassification)
	Loch Lomond coyote-thistle (reclassification)
	MacFarlane's four-o'clock (reclassification)
	Pahrump poolfish (reclassification)
2	Gypsum wild-buckwheat (delisting)
	Lloyd's hedgehog cactus (delisting)
	McKittrick pennyroyal (delisting)
	Siler pincushion cactus (reclassification)
	Tumamoc globe-berry (delisting)
3	Bald eagle (reclassification)
4	Cape Sable seaside sparrow (reclassification)
	Inflated heelsplitter (delisting)
	Louisiana pearlshell (reclassification)
	Magazine Mountain shagreen (delisting)
	Slackwater darter (delisting)
5	Small whorled pogonia (reclassification)
	Virginia round-leaf birch (reclassification)
6	Kendall Warm Springs dace (reclassification)
	Maguire daisy (reclassification)
	Spineless hedgehog cactus (delisting)
	Uinta Basin hookless cactus (delisting)
7	Arctic peregrine falcon (delisting)

Some of the above delistings and reclassifications are due to taxonomic changes in the species' classification (e.g., cuneate bidens, Lloyd's hedgehog cactus, spineless hedgehog cactus) or discovery of additional secure populations (e.g., gypsum wild-buckwheat, tumamoc globe-berry, Maguire daisy). All listings are based on the best biological and commercial (trade) information available at the time of listing, and new data routinely become available as studies progress. When new information becomes available after listing indicating that species should not receive the Act's protection, the Service publishes proposals to remove those species from the Lists of Endangered and Threatened Wildlife and Plants.

William Greer

Florida Game and Fresh Water Fish Commission biologists darted and captured this 5- to 6-month-old Florida panther cub in southern Florida for the captive breeding effort.

Recovered Species Monitoring Program

A species is considered "recovered" when the factors that initially led to its listing are remedied and protection under the Endangered Species Act is no longer needed. For many species, concerted efforts are required on the part of Federal and State authorities, as well as private parties, to enact laws and regulations and to reach agreements to protect listed species independent of the Endangered Species Act. Only when adequate legal mechanisms independent of the Act are implemented to manage a listed species whose populations have recovered can the species be truly said to no longer require Endangered Species Act protection and thus be considered for delisting.

The 1988 amendments to the Act recognized this potential conflict involving recovered species and their removal from the protective oversight of the Act. Section 4 of the Act was amended by adding a requirement that recovered species be monitored for at least 5 years after delisting. Recognizing the importance of and need for cooperation with State governments, the Service's goal is to rely on States to accomplish monitoring except in cases where the species are wide-ranging or migratory beyond State lines. In the event of a "significant risk to the well being" of any delisted species, the Secretary must use his emergency authority under section 4(b)(7) to relist the species. The Service is currently developing internal guidance for the monitoring of recovered (i.e., delisted) species.

Relationship of Recovery to Other Sections of the Act

Coordination among Federal, State, and local agencies, academic researchers, conservation organizations, private individuals, and major land users is perhaps the most essential ingredient for the development and implementation of an effective recovery program. In its role as coordinator of the recovery process, the Service emphasizes cooperation and teamwork among all involved parties. Below is a summary of sections 6, 7, and 10 of the Act and their relationships to recovery of listed species.

Section 6

Section 6 of the Endangered Species Act authorizes the Secretary of the Interior to enter into a cooperative agreement with any State that establishes and maintains an adequate and active program for the conservation of endangered and threatened species. Under section 6, the Service provides 75 percent of project funds (90 percent when two or more States cooperate on the same species) that can be used for tasks covering all phases of the Act, from prelisting to delisting. The applicable State would cover the remaining project costs.

These grants are appropriated from the Cooperative Endangered Species Conservation Fund, which was established by the 1988 amendments to the Act. This fund is authorized up to the level of 5 percent of the combined amounts covered annually in the Federal Aid in Wildlife Restoration and the Sport Fish Restoration accounts, and these amounts are authorized to be appropriated annually. The authorized amount from those two sources is approximately $22 million annually and continues to increase. By the end of FY 1992, the fund had accumulated an estimated $76 million for appropriation. However, in FY 1991 and FY 1992, $6.674 and $6.620 million were allocated annually, respectively.

Caren Caljouw, Virginia Department of Conservation and Recreation

Prescribed burning conducted by staff at the Virginia Department of Conservation and Recreation and The Nature Conservancy benefits the endangered Peter's Mountain mallow. The fire heat cracks the hard seed coat of the mallow, which allows moisture into the seed to stimulate germination.

To qualify for funding under section 6, States must have entered into a cooperative agreement with the Service. To obtain a cooperative agreement, a State must:

1. Have the necessary legal authority to conserve resident species of fish or wildlife or plants determined by either the State agency or the Fish and Wildlife Service to be endangered or threatened;
2. Have an acceptable established conservation program consistent with the purposes and policies of the Act;
3. Have the authority to conduct investigations on the status and needs of resident species;
4. Have the authority to acquire habitat or interests therein for the conservation of resident endangered or threatened species; and
5. Provide for public participation in the designation of State-listed species.

All 50 States, as well as Puerto Rico, the Virgin Islands, and Guam, are now under cooperative agreements with the Service for animals. Eleven States do not have plant agreements. States are full partners with the Service in endangered species matters. Not all States are funded to support large endangered species efforts, but all are intensely interested and supportive. They have local biological expertise, contacts with local governments and private landowners, and general knowledge of State institutions and customs the Service could never match.

Grants are authorized to the States and Territories for conservation of threatened and endangered species and for monitoring the status of candidate and recovered species. Consideration is given to:

1. The relative urgency in terms of a species' survival to initiate a program to restore and protect an endangered or threatened species;
2. The potential for restoring endangered or threatened species within a State;
3. The readiness of a State to proceed with a conservation program;

4. The importance of monitoring the status of recovered species within a State to assure that such species do not return to the point at which the measures provided pursuant to the Act are again necessary; and
5. The importance of monitoring the status of candidate species within a State to prevent a significant risk to the well-being of any such species.

Given the number of listed species and their needs, the majority of funding to date has been used to support implementation of recovery actions. Often monitoring is needed to determine if recovery activities are working. As funds permit, efforts are placed on candidates. As more species are delisted and as funds are available, more attention is likely to be placed on monitoring recovered species.

According to figures provided from the International Association of Fish and Wildlife Agencies, readily identifiable expenditures reported by States that responded to the Service's request totaled over $64 million in FY 1991 and $131 million in FY 1992. In FY 1991, States spent approximately 32 percent more than the Fish and Wildlife Service on endangered species. In FY 1992, they spent over twice as much as the Service.

Many worthwhile projects have been conducted under section 6. For example, in Virginia alone, in FY 1992 the following section 6 activities were conducted: Roanoke logperch recolonization studies, endangered mussel surveys and habitat protection, mussel transplants, piping plover surveys and habitat protection, Virginia northern flying squirrel distribution studies, northeastern beach tiger beetle protection strategy development, Peter's Mountain mallow monitoring and DNA studies, and Virginia round-leaf birch monitoring.

Section 7

As a central means of accomplishing the goals of the Act and halting species extinction, Congress placed special responsibilities on all Federal agencies to ensure that the Federal government would not contribute to the extermination of a species.

These responsibilities fall into two categories under section 7 of the Act. First, under section 7(a)(1), Federal agencies are directed to use their existing authorities to promote the conservation of listed species. Second, under section 7(a)(2), Federal agencies are precluded from authorizing, funding, or carrying out activities that are likely to jeopardize the continued existence of a listed species or destroy or adversely modify its critical habitat. Through consultation with the Service before initiating projects, the agencies review their actions to determine whether they could adversely affect listed species or their habitat.

The section 7(a)(2) consultation may be either "informal" or "formal." Informal consultation provides an assessment of a proposed project to determine if formal consultation is required or if project modifications could be implemented that remove the identified threat to the species. If an agency finds an action "may adversely affect" a listed species or its habitat, formal consultation is required. Formal consultation results in a biological opinion outlining the Service's assessment of the proposed activity and its likely impact on the listed species. If the opinion is "no-jeopardy," the action agency is free to proceed. If the project is likely to jeopardize that species, the Service attempts to identify "reasonable and prudent alternatives" that allow the project, or a modified version, to proceed.

A recent study of the Act and its implementation of section 7 found that in a 5-year period (1987-1991) the Service conducted 71,560 informal (including technical assistance given) and 2,000 formal consultations. The informal consultations increased by nine-fold and formal consultations doubled in this 5-year timeframe. Of the 2,000 formal consultations, only 350 (17 percent) resulted in a finding of likely jeopardy to the species, and only 23 (6.6 percent) of these jeopardy opinions were situations where the Service could not present an alternative that would allow the project to go forward.

The consultation requirement of section 7 is a coordination tool used in working with Federal agencies to assist them in designing their programs and projects to help conserve listed and proposed species. Since a significant number of listed species either occur on Federal lands or are potentially affected by Federal activities, the Service's coordination with other Federal agencies is crucial to species conservation and may preclude the need to list candidate species.

A significant example of section 7 contributions to recovery plan actions is acquisition and protection of endangered species habitats required under biological opinions for southern San Joaquin Valley projects in California. Approximately 4,000 acres have been acquired or protected in the Lokern Road and Semitropic Ridge areas of Kern County under past section 7 consultations, and additional acreage is being addressed in current section 7 consultations. Species that have benefitted from these consultations include the San Joaquin kit fox, blunt-nosed leopard lizard, giant kangaroo rat, and Kern mallow.

A Fish and Wildlife Service biologist collects prey remains from an American peregrine falcon nest near the Yukon River, Alaska, to study food habits.

Another example of section 7 consultation promoting recovery occurred in North Carolina. A formal consultation resulted in the Forest Service developing a monitoring/protection plan for Pink Beds Bog to conserve swamp pink, a threatened plant species. This effort included documenting changes in the size and health of the population of swamp pink and the hydrology of the area. The Forest Service also implemented a management strategy for the population, rerouted a trail that was impacting the area, and developed educational materials.

Section 7 interagency cooperation can be a significant factor in the recovery of many listed species, either by Federal agencies meeting their section 7(a)(1) obligations through the implementation of conservation recommendations, or by carrying out reasonable and prudent alternatives resulting under section 7(a)(2).

Section 10(a)(1)(B)

Section 10(a)(1)(B) provides for the preparation of a Habitat Conservation Plan (HCP) for construction projects on private land and allows some take of species if such taking is incidental to, and not the purpose of, an otherwise lawful activity. To get an incidental take permit, an applicant must submit a HCP that will, to the maximum extent practicable, minimize and mitigate the impacts of incidental taking and will not appreciably reduce the likelihood of the survival and recovery of the species in the wild. Congress intended that this process be used to reduce conflicts between listed species and private development and to provide a framework that would encourage "creative partnerships" between the private sector and local, State, and Federal agencies in the interests of listed species and habitat conservation.

HCPs are receiving increased interest from the public. During FY 1991 and FY 1992, the Service's involvement in HCPs tripled. By the end of FY 1992, the Service was assisting with over 70 HCPs in 14 States and 3 Territories. In some cases, this represents an opportunity for resolution of both real and perceived conflicts between listed species and private activities. Habitat conservation planning may also offer opportunities that protect habitat for candidate species and preclude the need for listing of these species.

The Service's role in the habitat conservation planning process is to provide technical assistance to the private applicant. At the onset of the habitat conservation planning process in the early 1980s, it was the Service's policy to limit its involvement in this process. However, as the habitat conservation planning process has evolved, the Service is finding that the process works best when the Service is an active participant.

In FY 1991, Congress added $500,000 to the Service budget for habitat conservation planning activities in southern California. In FY 1992, the following directives applied:

$600,000 —	California HCPs led by Laguna Niguel Field Office
$100,000 —	Hawaii and Pacific Territories HCPs
$100,000 —	Balcones Canyonlands HCP in Travis County, Texas
$100,000 —	HCPs in the southeastern United States
$50,000 —	Washington County, Utah HCP

An example of a recently completed HCP expected to benefit the northern spotted owl involved the Simpson Timber Company. The Simpson Timber Company HCP was completed and an incidental take permit granted in 1992. This HCP established over 40,000 acres of set-asides and special management areas for the northern spotted owl on the company's property. The plan provides for marking and monitoring of owls displaced by timber harvest activities and evaluation of the use of young timber stands by owls. This research and monitoring should prove very valuable in future efforts to maintain owls in managed timberlands.

The Service is also working on numerous habitat conservation planning actions in the southern San Joaquin Valley, including the Metropolitan Bakersfield, Kern County Valley Floor, Kern Fan Element, California Aqueduct, Kern County Landfill, San Emidio New Town, Envirocycle, and Champagne Shores HCPs, and is involved in the development of a comprehensive HCP involving birds, plants, amphibians, and invertebrates in Austin, Texas. One of the chief components in each of these HCPs is a provision for long-term protection of endangered species habitats designed to offset the effects of each proposed project and contribute to species recovery. Some of the species that will benefit from the development of these HCPs are the blunt-nosed leopard lizard, San Joaquin kit fox, giant kangaroo rat, and Tipton kangaroo rat.

Section 10(j)

Among the significant changes made in the 1982 amendments to the Act was the creation of section 10(j), which provides for the designation of specific populations of species listed as "experimental populations." Under section 10(j), reintroduced populations of endangered or threatened species established outside the current range but within the species' historical range may be designated, at the discretion of the Service, as "experimental," lessening the Act's regulatory authority over such populations.

Thus, because these populations are not provided full Endangered Species Act protection, management flexibility is increased, local opposition is reduced, and more reintroductions are possible. Two types of experimental population designations exist: essential and nonessential. An essential experimental population is a reintroduced population whose loss would be likely to appreciably reduce the likelihood of the survival of the species in the wild. These populations are treated as threatened species (with special rules) for the purposes of section 9 of the Act. Therefore, they can be managed with greater flexibility with regard to incidental take and regulated take.

A nonessential experimental population is a reintroduced population whose loss would not be likely to appreciably reduce the likelihood of the survival of the species in the wild. These populations, besides being treated as threatened species, are treated as proposed species for the purposes of section 7. However, if the population occurs within the national park system or the national wildlife refuge system, it is still treated as if listed as threatened for the purposes of section 7.

The establishment of experimental populations is a valuable tool for use in the recovery of some listed species. Examples of experimental populations include the black-footed ferret in Wyoming, Guam rail on Rota, and red wolf in North Carolina.

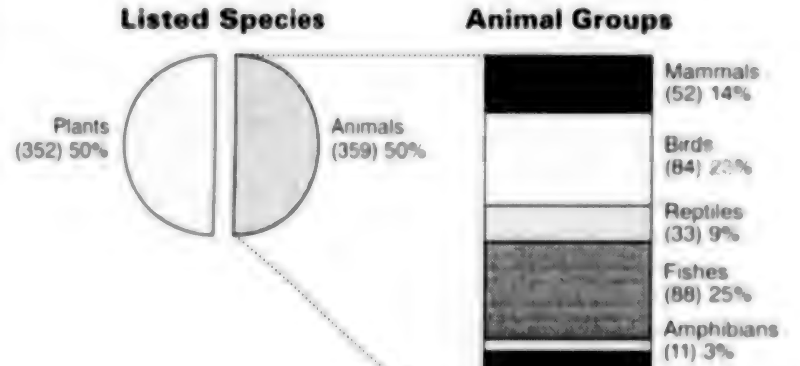
Data Analyses and Findings

All listed species under the Service's jurisdiction occurring in the United States and Trust Territories as of September 30, 1992, are presented in the section titled Listed Species and Selected Species Highlights by State. A map is included, indicating the number of listed species by State/Territory. Species listed under "similarity of appearance" and extirpated species are not included in the totals identified.

As of September 30, 1992, 728 species were listed as endangered or threatened in the United States and Trust Territories. Figure 1 presents the percentage, by taxonomic group, of species listed. All taxonomic groups are represented.

Of the 728 U.S. listed species as of September 30, 1992, 711 are under the jurisdiction of the Fish and Wildlife Service. Of the 711 species, 170 have been listed for less than 3 years. Species listed in the last 3 years have been dominated by plants (79 percent). For the most part, species listed less than 3 years do not yet have approved recovery plans. Many do, however, have plans in some stage of development. Recovery outlines are developed within 60 days of publication of the final rule listing a species and are submitted to the Director to be used as a guide for activities until recovery plans are developed.

Figure 1. All Listed Species
Separated by Taxonomic Group



As of September 30, 1992

Table 1 outlines the taxonomic distribution of species with and without approved recovery plans.

Table 1. Listed Species Under Fish and Wildlife Service Jurisdiction With and Without Approved Recovery Plans—Taxonomic Distribution

Group	*Number of Species*	*With Plans*	*Without Plans*
Plants	352	150	202
Mammals	52	33	19
Birds	84	72	12
Reptiles	33	25	8
Amphibians	11	9	2
Fishes	88	57	31
Invertebrates	91	64	27
Total	711	410	301

Of the 711 species, 410 (58 percent) had approved recovery plans as of September 30, 1992, while 468 (66 percent) had either an approved recovery plan or one that was in draft (i.e., Technical or Agency Draft plans). Of the remaining 301 species without recovery plans, 170 have been listed for less than 3 years and recovery plans are under development. Furthermore, 15 species (2 percent) will not have plans developed for the reasons indicated below. That leaves 116 species listed longer than 3 years that do not yet have approved recovery plans. As described earlier, the Service has developed a plan to reduce this backlog of species without recovery plans by the end of FY 1996. In addition, plans are under way to emphasize multi-species recovery planning, where appropriate, to help address the backlog, as well as to focus on ecosystem recovery efforts for groups of species.

Judy Jacobs

A Randolph-Macon College professor (left) and a Montgomery County Natural Resources Division biologist (right) paint marks on northeastern beach tiger beetles in Maryland as part of a mark-recapture study to determine dispersal distance and the effects of human disturbance on breeding behavior.

Section 4(f)(1) of the Act requires the preparation of a recovery plan for listed species unless it can be found that such a plan would not promote the conservation of a species. Currently, there are 15 species for which the Service does not intend to develop recovery plans. Recovery plans will not be prepared for the following species for the reasons indicated:

Taxonomic Changes

(Proposals for delisting under preparation)

Bidens, cuneate (*Bidens cuneata*)—This species has been taxonomically merged into the species *B. molokaiensis*, which is a relatively common plant on Molokai.

Cactus, Lloyd's hedgehog (*Echinocereus lloydii* [=*E. roetteri* var. *lloydii*])—This plant is now recognized as a hybrid.

Possible Extinction

Madtom, Scioto (*Noturus trautmani*)—This fish has not been collected or located since 1957 despite intensive sampling from 1981 to 1985.

Mallard, Mariana (*Anas oustaleti*)—This species has not been seen in the wild since 1979 despite extensive surveys and is probably extinct in the wild.

Warbler, Bachman's (*Vermivora bachmanii*)—Bachman's warblers declined rapidly after 1915; by 1950 few were reported. Research by the Forest Service and intensive literature reviews provide no scientific evidence of existing populations despite occasional sightings of birds on Cuban wintering grounds. In lieu of a recovery plan, breeding surveys in the most important historical nesting region in South Carolina will continue.

Woodpecker, ivory-billed (*Campephilus principalis*)—This species has not been documented in the wild in the United States since the early 1950s. The Service funded a status survey in 1986 and issued numerous press releases to seek additional information from the public. No evidence of the continued existence of the species in the United States was documented.

Discovery of New Populations

Globe-berry, Tumamoc (*Tumamoca macdougalii*)—This plant is more abundant than previously believed and is not threatened with extinction. A delisting proposal was published in August 1992.

Other

Coyote-thistle, Loch Lomond (*Eryngium constancei*)—The only known population of this species occurs on land owned and managed by the California Department of Fish and Game. The population has been enhanced. A proposal to reclassify the species from endangered to threatened is scheduled for publication in 1993.

Curlew, Eskimo (*Numenius borealis*)—In lieu of a recovery plan, a multi-national Advisory Group produced the Eskimo Curlew Conservation Strategy. Until more information on the status and location of the birds can be confirmed, no recovery plan will be pursued.

Gooseberry, Miccosukee (*Ribes echinellum*)—Suitable habitat is restricted to two protected populations. Threats to the site are stable, and a recovery plan would not aid the species at this point in time.

Shrimp, Squirrel Chimney (=Florida) cave (*Palaemonetes cummingi*)—This species' habitat is restricted to one sinkhole in Alachua County, Florida. The landowner supports protection of the sinkhole, and The Nature Conservancy has expressed an interest in acquiring the site. Recovery plan development is on hold.

Sucker, Modoc (*Catastomus microps*)—An "Interagency Action Plan for the Recovery of the Modoc Sucker" was originally approved in 1984 and revised in 1989. Cooperators include the Service, Forest Service, and California Department of Fish and Game. This plan serves as a valid substitute for the recovery plan.

Trout, Little Kern golden (*Oncorhynchus* [=*Salmo*] *aquabonita whitei*)—The "Fishery Management Plan for the Little Kern Golden Trout" developed by the California Department of Fish and Game in cooperation with the Service, Forest Service, and National Park Service serves as a substitute for a recovery plan.

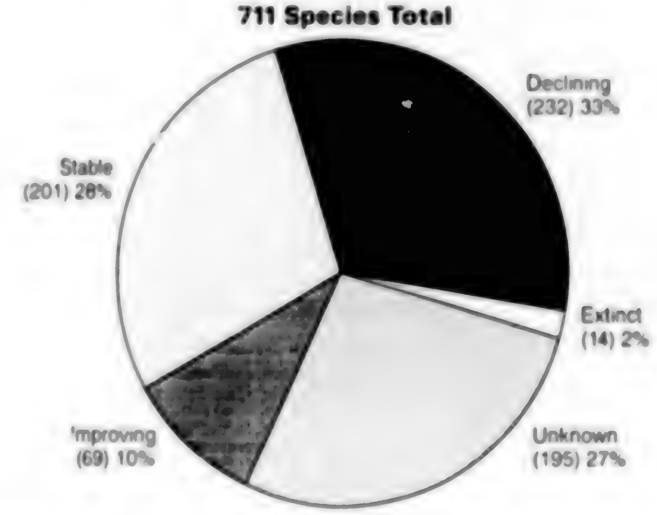
Turtle, olive (=Pacific) Ridley sea (*Lepidochelys olivacea*)—For all practical purposes, this animal does not occur in the United States. This marine species is covered by the National Marine Fisheries Service's Recovery Plan for Marine Turtles.

Vole, Florida salt marsh (*Microtus pennsylvanicus dukecampbelli*)—Due to the restricted range of the species, the Army Corps of Engineers' jurisdiction over activities in this habitat, and the activities of the State of Florida to possibly acquire the site, the Service has deferred recovery plan development.

Major goals of the Endangered Species Act are to prevent extinctions, reverse species declines, stabilize populations, prevent further habitat degradation, and restore habitat necessary for recovery. In spite of protection afforded by the Act, the status of a number of listed species remains critical due to their precarious status at the time of listing. Ten percent are considered improving and 28 percent are considered stable as a direct result of recovery efforts, but a sizeable number (33 percent) are still considered declining and 2 percent are believed extinct. Due to budgetary and staffing constraints, the status of 27 percent of the listed species is unknown; further research and survey work are needed to determine each "unknown" species' overall status. (See Figure 2.)

Most of the species considered to be improving are mammals, birds, or plants. A significant majority of them are recovering from very low numbers, with the benefit of intensive, hands-on management. Bird and fish species represent most of the taxa considered to be stable. The unknown component is most pronounced in invertebrates, reflecting a need for additional studies. Three-fourths of the prominent declining status of invertebrates are freshwater mussels.

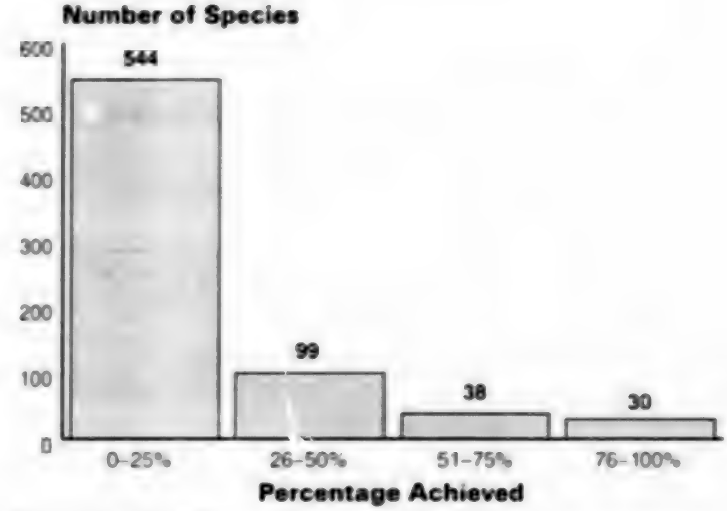
Figure 2. Recovery Status
All Listed Species



As of September 30, 1992

Primary recovery objectives include delisting, downlisting, or protection of existing populations for a specific time period or for the foreseeable future. Tasks are identified in each species' recovery plan to satisfy the recovery criteria aimed at achievement of the recovery objective. The percentages of recovery objectives achieved are used as a measure of progress toward species recovery.

Figure 3. Recovery Objectives Achieved
All Listed Species



As of September 30, 1992

Figure 3 shows the percentage of recovery objectives achieved for all listed species. Of the 711 listed species under the Service's jurisdiction, 544 (77 percent) fall in Level 1 (< 25 percent of recovery objectives achieved). All recently listed species fall in Level 1. The number of listed species in Level 1 can be expected to increase if listing is accelerated by multi-species/ecosystem listings. In addition, it indicates the long-term nature of listed species recovery.

Ninety-nine species (14 percent) fall in Level 2 (26 to 50 percent of recovery objectives achieved), 38 species (5 percent) in Level 3 (50 to 75 percent of recovery objectives achieved), and 30 species (4 percent) in Level 4 (> 75 percent of recovery objectives achieved). Examples of species that fall in Level 4 include the Columbian white-tailed deer, bald eagle, Pahrump poolfish, Socorro isopod, and Maguire daisy.

Ultimately, conservation of all listed species should be incorporated into a broadly based effort to maintain biodiversity, of which listed species are an important component. Through creative partnerships, the Service will increase the involvement of private groups, State and local agencies, and other Federal agencies in the development and implementation of recovery plans and actions. Focusing more on ecosystems, thereby surpassing a species-by-species approach to recovery, will more efficiently address the long-term conservation needs of groups of species.

A commitment to endangered and threatened species recovery is needed for many years to allow for noticeable results. Long-term planning is needed to address the program objectives. Though the timeframe involved may be perceived as lengthy, recovery can and does happen. A serious commitment of both personnel and money is important to ensure the stabilization and recovery of listed species and the long-term support of biodiversity.

Susan Wallace

A Fish and Wildlife Service employee and a Bok Tower Gardens volunteer plant the endangered Lakela's mint at Hobe Sound National Wildlife Refuge in Florida as part of the recovery effort.

Status of Listed Species and Recovery Plan Development

This section addresses the status of each listed species. Each species' status is identified as Improving, Stable, Declining, Unknown, or Extinct.

Species status is reported with a single letter.

I = Improving (Increasing) — is for those species known to be increasing in numbers and/or whose threats to their continued existence are lessening in the wild.

S = Stable — is for those species known to have stable numbers over the recent past and whose threats have remained relatively constant or diminished in the wild.

D = Declining — is for those species known to be decreasing in numbers and/or whose threats to their continued existence are increasing in the wild.

U = Unknown — is for those species where additional survey work is required to determine their current status.

E = Extinct — is for those species that are believed to be extinct in the wild.

This section also outlines the status of development and implementation of recovery plans for all species occurring in the United States and Trust Territories. Data for each listed species includes: (1) whether or not the species has an approved recovery plan and, if not, whether one will be prepared; (2) the stage of the recovery plan, and (3) the percentage of the species' recovery objective(s) that have been met.

The status of recovery plan development is reported as indicated below.

F = Final-Approved

Rev = Revision — Approved

A = Agency Draft

RA = Revision — Agency Draft

T = Technical Draft

RT = Revision — Technical Draft

T/A = Technical/Agency Draft

RT/A = Revision — Technical/Agency Draft

U = Under Development or Planned for Development

RU = Revision — Under Development

NA = Not Applicable

A Technical Draft is one undergoing peer review by other Service biologists and outside experts prior to development of an Agency Draft. An Agency Draft is one made available for review by all interested agencies and parties, including the general public. In some cases, a Technical/Agency Draft is developed to be reviewed simultaneously by all interested parties.

The percentage of species recovery objective(s) achieved is indicated with a value of 1 to 4 as defined below.

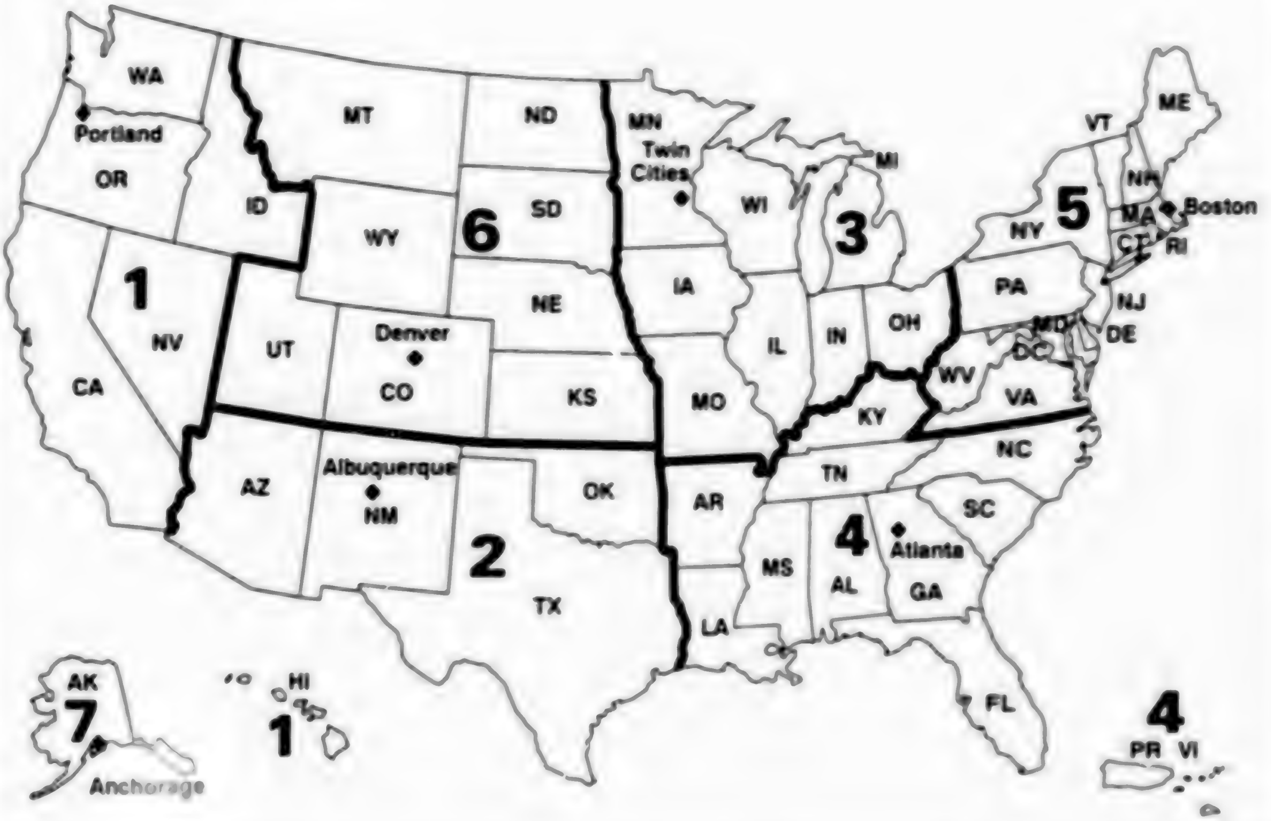
1 = 0–25 percent achieved

2 = 26–50 percent achieved

3 = 51–75 percent achieved

4 = 76–100 percent achieved

Regional Office Boundaries



The Fish and Wildlife Service is comprised of a headquarters operation in Washington, D.C., seven operational Regional Offices that provide geographic coverage of the United States and Trust Territories, and an eighth Regional Office (Research and Development) that deals with foreign species. In this section of the report entitled Status of Listed Species and Recovery Plan Development, the lead Region is listed for each species. Coordination among Regions regarding species status occurs when known ranges overlap Regional boundaries.

Listed Species	*Listed As*	*Lead Region*	*Status*	*Rec. Plan*	*Plan Stage*	*Recovery Achieved*
Mammals						
Bat, gray	E	3	I	Y	F	3
Bat, Hawaiian hoary	E	1	U	N	U	1
Bat, Indiana	E	3	S	Y	Rev	2
Bat, little Mariana fruit	E	1	E	Y	F	1
Bat, Mariana fruit	E	1	D	Y	F	1
Bat, Mexican long-nosed	E	2	U	N	U	1
Bat, Ozark big-eared	E	2	U	Y	RU	1
Bat, Sanborn's long-nosed	E	2	U	N	U	1
Bat, Virginia big-eared	E	5	I	Y	F	2
Bear, brown (=grizzly)	T	6	S	Y	RA	2
Bear, Louisiana black	T	4	U	N	U	1
Beaver, Point Arena mountain	E	1	U	N	U	1
Caribou, woodland	E	1	I	Y	RA	2
Cougar, eastern	E	5	E	Y	F	1
Deer, Columbian white-tailed	E	1	I	Y	Rev	4
Deer, key	E	4	S	Y	Rev	2
Ferret, black-footed	E	6	I	Y	Rev	1
Fox, San Joaquin kit	E	1	D	Y	RU	1
Jaguarundi (2 spp.)	E	2	U	Y	F	1
Manatee, West Indian (=Florida)	E	4	D	Y	Rev	1
Mouse, Alabama beach	E	4	I	Y	F	2
Mouse, Anastasia Island beach	E	4	I	N	U	1
Mouse, Choctawhatchee beach	E	4	S	Y	F	2
Mouse, Key Largo cotton	E	4	S	N	U	4
Mouse, Perdido Key beach	E	4	I	Y	F	2
Mouse, salt marsh harvest	E	1	D	Y	F	1
Mouse, southeastern beach	T	4	D	N	U	1
Ocelot	E	2	S	Y	F	1
Otter, southern sea	T	1	S	Y	RA	1
Panther, Florida	E	4	S	Y	Rev	2
Prairie dog, Utah	T	6	S	Y	F	3
Pronghorn, Sonoran	E	2	U	Y	F	1
Rabbit, Lower Keys	E	4	D	N	U	1
Rat, Fresno kangaroo	E	1	D	N	U	1
Rat, giant kangaroo	E	1	D	N	U	2
Rat, Morro Bay kangaroo	E	1	D	Y	F	1
Rat, rice (=silver rice)	E	4	D	N	U	1
Rat, Stephens' kangaroo	E	1	S	N	U	1
Rat, Tipton kangaroo	E	1	D	N	U	1
Shrew, Dismal Swamp southeastern	T	5	S	N	U	2
Squirrel, Carolina northern flying	E	4	S	Y	F	1
Squirrel, Delmarva Peninsula fox	E	5	S	Y	RT/A	2
Squirrel, Mount Graham red	E	2	S	N	T/A	1
Squirrel, Virginia northern flying	E	5	I	Y	F	3
Vole, Amargosa	E	1	D	N	T/A	1
Vole, Florida salt marsh	E	4	D	NA	NA	1
Vole, Hualapai Mexican	E	2	U	Y	F	1
Wolf, gray (eastern timber)	E,T	3	I	Y	Rev	4
Wolf, gray (Mexican)	E	2	I	Y	RU	1
Wolf, gray (Rocky Mountain)	E	6	I	Y	Rev	1
Wolf, red	E	4	I	Y	Rev	1
Woodrat, Key Largo	E	4	S	N	U	4

Listed Species	*Listed As*	*Lead Region*	*Status*	*Rec. Plan*	*Plan Stage*	*Recovery Achieved*
Birds						
'Akepa, Hawaii (honeycreeper)	E	1	S	Y	F	2
'Akepa, Maui (honeycreeper)	E	1	D	Y	F	1
'Akialoa, Kauai (honeycreeper)	E	1	U	Y	F	1
'Akiapola'au (honeycreeper)	E	1	S	Y	F	2
Blackbird, yellow-shouldered	E	4	S	Y	F	1
Bobwhite, masked (quail)	E	2	I	Y	RA	2
Broadbill, Guam	E	1	E	Y	F	1
Caracara, Audubon's crested	T	4	S	Y	F	1
Condor, California	E	1	I	Y	RU	2
Coot, Hawaiian ('alae-ke'eke'o)	E	1	S	Y	RU	3
Crane, Mississippi sandhill	E	4	I	Y	Rev	1
Crane, whooping	E	2	I	Y	RA	2
Creeper, Hawaii	E	1	S	Y	F	2
Creeper, Molokai (kakawahie)	E	1	D	Y	F	1
Creeper, Oahu (alauwahio)	E	1	U	N	U	1
Crow, Hawaiian ('alala)	E	1	D	Y	RU	1
Crow, Mariana	E	1	D	Y	F	1
Curlew, Eskimo	E	7	U	NA	NA	1
Duck, Hawaiian (koloa)	E	1	S	Y	RU	3
Duck, Laysan	E	1	S	Y	F	3
Eagle, bald	E,T	3	I	Y	F	4
Falcon, American peregrine (Alaska)	E	7	I	Y	RA	4
Falcon, American peregrine (eastern)	E	5	I	Y	Rev	3
Falcon, American peregrine (western)	E	1	I	Y	F	3
Falcon, Arctic peregrine	T	7	I	Y	RA	4
Falcon, northern aplomado	E	2	U	Y	F	1
Finch, Laysan (honeycreeper)	E	1	S	Y	F	3
Finch, Nihoa (honeycreeper)	E	1	S	Y	F	3
Goose, Aleutian Canada	T	7	I	Y	Rev	3
Goose, Hawaiian (nene)	E	1	D	Y	F	2
Hawk, Hawaiian (io)	E	1	S	Y	F	4
Honeycreeper, crested ('akohekohe)	E	1	S	Y	F	2
Jay, Florida scrub	T	4	D	Y	F	1
Kingfisher, Guam Micronesian	E	1	E	Y	F	1
Kite, Everglade snail	E	4	S	Y	Rev	1
Mallard, Mariana	E	1	E	NA	NA	1
Megapode, Micronesian (=La Perouse's)	E	1	U	N	U	1
Millerbird, Nihoa (old world warbler)	E	1	S	Y	F	3
Monarch, Tinian (old world flycatcher)	T	1	S	N	U	4
Moorhen (=gallinule), Hawaiian common	E	1	S	Y	Rev	3
Moorhen (=gallinule), Mariana common	E	1	S	Y	F	1
Nightjar (=whip-poor-will), Puerto Rican	E	4	S	Y	F	2
Nukupu'u (honeycreeper)	E	1	D	Y	F	1
'O'o, Kauai ('o'o 'a'a) (honeyeater)	E	1	D	Y	F	1
'O'u (honeycreeper)	E	1	D	Y	F	1
Owl, northern spotted	T	1	D	N	T/A	1
Palila (honeycreeper)	E	1	S	Y	Rev	3
Parrot, Puerto Rican	E	4	I	Y	Rev	1
Parrotbill, Maui (honeycreeper)	E	1	S	Y	F	1
Pelican, brown (California population)	E	1	D	Y	F	3
Pelican, brown (Eastern population)	E	2	I	Y	F	3
Petrel, Hawaiian dark-rumped	E	1	S	Y	F	2

Listed Species	*Listed As*	*Lead Region*	*Status*	*Rec. Plan*	*Plan Stage*	*Recovery Achieved*
Pigeon, Puerto Rican plain	E	4	I	Y	F	1
Plover, piping (Atlantic Coast)	T	5	S	Y	F	2
Plover, piping (Great Lakes/Northern Great Plains)	E,T	3	D	Y	F	1
Po'ouli (honeycreeper)	E	1	D	Y	F	1
Prairie-chicken, Attwater's greater	E	2	D	Y	RT/A	1
Rail, California clapper	E	1	D	Y	F	1
Rail, Guam	E	1	E	Y	F	1
Rail, light-footed clapper	E	1	S	Y	Rev	1
Rail, Yuma clapper	E	2	I	Y	F	3
Shearwater, Newell's Townsend's ('a'o)	T	1	S	Y	F	2
Shrike, San Clemente loggerhead	E	1	D	Y	F	1
Sparrow, Cape Sable seaside	E	4	I	Y	F	4
Sparrow, Florida grasshopper	E	4	U	Y	F	1
Sparrow, San Clemente sage	T	1	U	Y	F	1
Stilt, Hawaiian (ae'o)	E	1	S	Y	RU	3
Stork, wood	E	4	S	Y	F	3
Swiftlet, Mariana gray (Vanikoro)	E	1	S	Y	F	1
Tern, California least	E	1	I	Y	RU	1
Tern, least (interior population)	E	3	I	Y	F	1
Tern, roseate	E	5	S	Y	F	1
Thrush, large Kauai	E	1	D	Y	F	1
Thrush, Molokai (oloma'o)	E	1	D	Y	F	1
Thrush, small Kauai (puaiohi)	E	1	S	Y	F	1
Towhee, Inyo California (=brown)	T	1	S	N	U	1
Vireo, black-capped	E	2	U	Y	F	1
Vireo, least Bell's	E	1	I	N	A	1
Warbler (old world), nightingale reed	E	1	S	N	U	1
Warbler (wood), Bachman's	E	4	U	NA	NA	1
Warbler (wood), golden-cheeked	E	2	U	Y	F	1
Warbler (wood), Kirtland's	E	3	I	Y	Rev	2
White-eye, bridled	E	1	E	Y	F	1
Woodpecker, ivory-billed	E	4	E	NA	NA	1
Woodpecker, red-cockaded	E	4	D	Y	Rev	1
Reptiles						
Anole, Culebra Island giant	E	4	U	Y	F	1
Boa, Mona	T	4	U	Y	F	1
Boa, Puerto Rican	E	4	S	Y	F	1
Boa, Virgin Islands tree	E	4	U	Y	F	1
Crocodile, American	E	4	S	Y	Rev	2
Crocodile, saltwater (=estuarine)	E	1	D	N	U	1
Gecko, Monito	E	4	U	Y	F	1
Iguana, Mona ground	T	4	S	Y	F	2
Lizard, blunt-nosed leopard	E	1	D	Y	RU	1
Lizard, Coachella Valley fringe-toed	T	1	D	Y	RU	2
Lizard, Island night	T	1	S	Y	F	4
Lizard, St. Croix ground	E	4	S	Y	F	1
Rattlesnake, New Mexican ridge-nosed	T	2	S	Y	F	1
Skink, blue-tailed mole	T	4	D	N	U	1
Skink, sand	T	4	D	N	U	1
Snake, Atlantic salt marsh	T	4	D	N	U	1
Snake, Concho water	T	2	S	N	T/A	1
Snake, eastern indigo	T	4	D	Y	F	1

Listed Species	*Listed As*	*Lead Region*	*Status*	*Rec. Plan*	*Plan Stage*	*Recovery Achieved*
Snake, San Francisco garter	E	1	D	Y	F	1
Tortoise, desert	T	1	D	N	U	1
Tortoise, gopher	T	4	D	Y	F	1
Turtle, Alabama red-bellied	E	4	U	Y	F	1
Turtle, flattened musk	T	4	U	Y	F	1
Turtle, green sea	E,T	2	U	Y	Rev	1
Turtle, hawksbill sea (=carey)	E	2	U	Y	RT/A	1
Turtle, Kemp's (=Atlantic) ridley sea	E	2	D	Y	Rev	1
Turtle, leatherback sea	E	2	U	Y	Rev	1
Turtle, loggerhead sea	T	2	D	Y	Rev	1
Turtle, olive (=Pacific) ridley sea	E,T	2	D	NA	NA	1
Turtle, Plymouth red-bellied	E	5	I	Y	Rev	2
Turtle, ringed sawback	T	4	S	Y	F	2
Turtle, yellow-blotched map (=sawback)	E	4	U	N	T	1
Amphibians						
Coqui, golden	T	4	D	Y	F	1
Salamander, Cheat Mountain	T	5	I	Y	F	3
Salamander, desert slender	E	1	U	Y	F	1
Salamander, Red Hills	T	4	D	Y	F	1
Salamander, San Marcos	T	2	D	Y	RU	1
Salamander, Santa Cruz long-toed	E	1	S	Y	Rev	1
Salamander, Shenandoah	E	5	S	N	U	1
Salamander, Texas blind	E	2	U	N	U	1
Toad, Houston	E	2	U	Y	F	1
Toad, Puerto Rican crested	T	4	U	Y	F	1
Toad, Wyoming	E	6	S	Y	F	2
Fishes						
Catfish, Yaqui	T	2	I	N	U	1
Cavefish, Alabama	E	4	S	Y	Rev	1
Cavefish, Ozark	T	4	I	Y	Rev	2
Chub, bonytail	E	6	D	Y	Rev	1
Chub, Borax Lake	E	1	S	Y	F	2
Chub, Chihuahua	T	2	S	Y	F	1
Chub, humpback	E	6	S	Y	Rev	1
Chub, Hutton tui	T	1	S	N	U	2
Chub, Mohave tui	E	1	D	Y	F	1
Chub, Owens tui	E	1	S	N	T/A	1
Chub, Pahranagat roundtail (=bonytail)	E	1	S	Y	F	1
Chub, slender	T	4	D	Y	F	1
Chub, Sonora	T	2	U	Y	F	1
Chub, spotfin	T	4	U	Y	F	1
Chub, Virgin River	E	6	D	N	A	1
Chub, Yaqui	E	2	S	N	U	1
Cui-ui	E	1	I	Y	Rev	2
Dace, Ash Meadows speckled	E	1	S	Y	F	2
Dace, blackside	T	4	U	Y	F	1
Dace, Clover Valley speckled	E	1	U	N	U	1
Dace, desert	T	1	S	N	U	1
Dace, Foskett speckled	T	1	U	N	U	2
Dace, Independence Valley speckled	E	1	U	N	U	1
Dace, Kendall Warm Springs	E	6	S	Y	F	3

Listed Species	*Listed As*	*Lead Region*	*Status*	*Rec. Plan*	*Plan Stage*	*Recovery Achieved*
Dace, Moapa	E	1	S	Y	F	2
Darter, amber	E	4	S	Y	F	1
Darter, bayou	T	4	S	Y	Rev	1
Darter, boulder (=Elk River)	E	4	S	Y	F	1
Darter, fountain	E	2	D	Y	RU	1
Darter, goldline	T	4	U	N	U	1
Darter, leopard	T	2	S	Y	RU	2
Darter, Maryland	E	5	D	Y	Rev	1
Darter, Niangua	T	3	D	Y	F	1
Darter, Okaloosa	E	4	D	Y	F	1
Darter, slackwater	T	4	U	Y	F	4
Darter, snail	T	4	U	Y	Rev	1
Darter, watercress	E	4	D	Y	Rev	1
Gambusia, Big Bend	E	2	S	Y	RU	2
Gambusia, Clear Creek	E	2	S	Y	F	2
Gambusia, Pecos	E	2	S	Y	F	2
Gambusia, San Marcos	E	2	E	Y	RU	1
Logperch, Conasauga	E	4	S	Y	F	1
Logperch, Roanoke	E	5	S	Y	F	1
Madtom, Neosho	T	6	D	Y	F	1
Madtom, Scioto	E	3	E	NA	NA	1
Madtom, smoky	E	4	S	Y	F	1
Madtom, yellowfin	T	4	D	Y	F	1
Minnow, loach	T	2	D	Y	F	1
Poolfish (=killifish), Pahrump	E	1	S	Y	F	4
Pupfish, Ash Meadows Amargosa	E	1	S	Y	F	2
Pupfish, Comanche Springs	E	2	D	Y	RU	1
Pupfish, desert	E	2	S	N	U	1
Pupfish, Devils Hole	E	1	S	Y	Rev	2
Pupfish, Leon Springs	E	2	S	Y	F	2
Pupfish, Owens	E	1	S	Y	F	1
Pupfish, Warm Springs	E	1	S	Y	Rev	2
Sculpin, pygmy	T	4	S	Y	F	1
Shiner, beautiful	T	2	D	N	U	1
Shiner, blue	T	4	U	N	U	1
Shiner, Cahaba	E	4	U	Y	F	1
Shiner, Cape Fear	E	4	U	Y	F	1
Shiner, Pecos bluntnose	T	2	D	Y	F	1
Silverside, Waccamaw	T	4	U	N	T/A	1
Spikedace	T	2	D	Y	F	1
Spinedace, Big Spring	T	1	U	N	T/A	1
Spinedace, Little Colorado	T	2	U	N	U	1
Spinedace, White River	E	1	D	N	T/A	1
Springfish, Hiko White River	E	1	S	N	U	1
Springfish, Railroad Valley	T	1	S	N	U	1
Springfish, White River	E	1	S	N	U	1
Squawfish, Colorado	E	6	S	Y	Rev	1
Stickleback, unarmored threespine	E	1	S	Y	Rev	1
Sturgeon, Gulf	T	4	S	N	U	1
Sturgeon, pallid	E	6	D	N	A	1
Sucker, June	E	6	D	N	T	1
Sucker, Lost River	E	1	D	N	U	1
Sucker, Modoc	E	1	D	NA	NA	1

Listed Species	*Listed As*	*Lead Region*	*Status*	*Rec. Plan*	*Plan Stage*	*Recovery Achieved*
Sucker, razorback	E	6	D	N	U	1
Sucker, short-nose	E	1	D	N	U	1
Sucker, Warner	T	1	U	N	T/A	1
Topminnow, Gila (incl. Yaqui)	E	2	D	Y	RU	2
Trout, Apache (=Arizona)	T	2	D	Y	Rev	2
Trout, Gila	E	2	D	Y	Rev	2
Trout, greenback cutthroat	T	6	I	Y	RT	4
Trout, Lahontan cutthroat	T	1	D	N	A	1
Trout, Little Kern golden	T	1	S	NA	NA	2
Trout, Paiute cutthroat	T	1	D	Y	F	1
Woundfin	E	6	D	Y	RA	1
Snails						
Ambersnail, Kanab	E	6	U	N	T	1
Shagreen, Magazine Mountain	T	4	S	N	T	4
Snail, Chittenango ovate amber	T	5	D	Y	F	1
Snail, flat-spired three-toothed	T	5	S	Y	F	2
Snail, Iowa Pleistocene	E	3	I	Y	F	3
Snail, noonday	T	4	S	Y	F	1
Snail, painted snake coiled forest	T	4	U	Y	F	1
Snail, Stock Island tree	T	4	D	Y	F	1
Snail, tulotoma (=Alabama live-bearing)	E	4	S	N	U	1
Snail, Virginia fringed mountain	E	5	S	Y	F	1
Snails, Oahu tree (19 spp.)	E	1	D	Y	F	1
Springsnail, Alamosa	E	2	S	N	U	1
Springsnail, Socorro	E	2	S	N	U	1
Clams						
Fanshell	E	4	D	Y	F	1
Fatmucket, Arkansas	T	4	U	Y	F	1
Heelsplitter, inflated	T	4	U	N	T	4
Mussel, Cumberland pigtoe	E	4	D	Y	F	1
Mussel, Curtus'	E	4	D	Y	F	1
Mussel, dwarf wedge	E	5	D	N	T/A	1
Mussel, Judge Tait's	E	4	D	Y	F	1
Mussel, Marshall's	E	4	D	Y	F	1
Mussel, Ouachita rock-pocketbook (Wheeler's pearlymussel)	E	2	D	N	U	1
Mussel, penitent	E	4	D	Y	F	1
Mussel, ring pink (=golf stick pearly)	E	4	D	Y	F	1
Mussel, winged mapleleaf	E	3	U	N	U	1
Pearlshell, Louisiana	E	4	I	Y	F	3
Pearly mussel, Alabama lamp	E	4	D	Y	F	1
Pearly mussel, Appalachain monkeyface	E	4	D	Y	F	1
Pearly mussel, birdwing	E	4	D	Y	F	1
Pearly mussel, cracking	E	4	D	Y	F	1
Pearly mussel, Cumberland bean	E	4	D	Y	F	1
Pearly mussel, Cumberland monkeyface	E	4	D	Y	F	1
Pearly mussel, Curtis'	E	3	D	Y	F	1
Pearly mussel, dromedary	E	4	D	Y	F	1
Pearly mussel, green-blossom	E	4	D	Y	F	1
Pearly mussel, Higgins' eye	E	3	U	Y	F	1
Pearly mussel, little-wing	E	4	D	Y	F	1
Pearly mussel (=pimple back), orange-footed	E	4	D	Y	F	1

Listed Species	*Listed As*	*Lead Region*	*Status*	*Rec. Plan*	*Plan Stage*	*Recovery Achieved*
Pearly mussel, pale lilliput	E	4	D	Y	F	1
Pearly mussel, pink mucket	E	4	D	Y	F	1
Pearly mussel, purple cat's paw	E	4	D	Y	F	1
Pearly mussel, tubercled-blossom	E	4	E	Y	F	1
Pearly mussel, turgid-blossom	E	4	E	Y	F	1
Pearly mussel, white cat's paw	E	3	U	Y	F	1
Pearly mussel, white wartyback	E	4	D	Y	F	1
Pearly mussel, yellow-blossom	E	4	E	Y	F	1
Pigtoe, fine-rayed	E	4	D	Y	F	1
Pigtoe, rough	E	4	D	Y	F	1
Pigtoe, shiny	E	4	D	Y	F	1
Pocketbook, fat	E	4	I	Y	Rev	2
Pocketbook, speckled	E	4	U	Y	F	1
Riffle shell, tan	E	4	D	Y	F	1
Spinymussel, James River (=Virginia)	E	5	D	Y	F	1
Spinymussel, Tar River	E	4	D	Y	Rev	1
Stirrup shell	E	4	D	Y	F	1
Crustaceans						
Amphipod, Hay's Spring	E	5	S	N	U	3
Cambarus zophonastes (=Sci. name)	E	4	S	Y	F	1
Crayfish, Nashville	E	4	U	Y	Rev	1
Crayfish, Shasta (=placid)	E	1	U	N	U	1
Isopod, Madison Cave	T	5	S	N	U	3
Isopod, Socorro	E	2	I	Y	F	4
Shrimp, Alabama cave	E	4	S	N	T	1
Shrimp, California freshwater	E	1	U	N	U	1
Shrimp, Kentucky cave	E	4	U	Y	F	1
Shrimp, Squirrel Chimney (=Florida) Cave	T	4	S	NA	NA	1
Insects						
Beetle, American burying (=giant carrion)	E	5	S	Y	F	1
Beetle, delta green ground	T	1	U	Y	F	1
Beetle, Kretschmarr Cave mold	E	2	U	N	U	1
Beetle, northeastern beach tiger	T	5	D	N	T	1
Beetle, Puritan tiger	T	5	D	N	T	1
Beetle, Tooth Cave ground	E	2	U	N	U	1
Beetle, valley elderberry longhorn	T	1	U	Y	F	1
Butterfly, bay checkerspot	T	1	D	N	U	1
Butterfly, El Segundo blue	E	1	I	Y	F	2
Butterfly, Lange's metalmark	E	1	I	Y	Rev	1
Butterfly, lotis blue	E	1	U	Y	F	1
Butterfly, mission blue	E	1	S	Y	F	2
Butterfly, Mitchell's satyr	E	3	D	N	U	1
Butterfly, Myrtle's silverspot	E	1	D	N	U	1
Butterfly, Oregon silverspot	T	1	D	Y	RU	2
Butterfly, Palos Verdes blue	E	1	D	Y	F	1
Butterfly, San Bruno elfin	E	1	S	Y	F	2
Butterfly, Schaus swallowtail	E	4	S	Y	F	1
Butterfly, Smith's blue	E	1	D	Y	F	1
Butterfly, Uncompahgre fritillary	E	6	S	N	T	1
Moth, Kern primrose sphinx	T	1	U	Y	F	1
Naucorid, Ash Meadows	T	1	D	Y	F	1
Skipper, Pawnee montane	T	6	U	N	U	1

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Arachnids						
Harvestman, Bee Creek Cave	E	2	U	N	U	1
Pseudoscorpion, Tooth Cave	E	2	U	N	U	1
Spider, Tooth Cave	E	2	U	N	U	1
Plants						
Abutilon eremitopetalum (=Sci. name)	E	1	U	N	U	1
Abutilon sandwicense (=Sci. name)	E	1	U	N	U	1
Achyranthes splendens var. rotundata (=Sci. name)	E	1	S	N	U	1
Agave, Arizona	E	2	U	N	U	1
'Akoko (Chamaesyce celastroides var. kaenana)	E	1	U	N	U	1
'Akoko (Chamaesyce kuwaleana)	E	1	U	N	U	1
'Akoko, Ewa Plains	E	1	S	N	U	1
Alani	E	1	U	N	U	1
Alsinidendron obovatum (=Sci. name)	E	1	U	N	U	1
Alsinidendron trinerve (=Sci. name)	E	1	U	N	U	1
Amphianthus, little	T	4	S	N	A	1
Arrowhead, bunched	E	4	D	Y	F	1
Aster, decurrent false	T	3	I	Y	F	2
Aster, Florida golden	E	4	D	Y	F	1
Aster, Ruth's golden	E	4	D	Y	F	1
Aupaka	E	1	U	N	U	1
Avens, spreading	E	4	D	N	A	1
'Awiwi	E	1	U	N	U	1
Barberry, Truckee	E	1	S	Y	F	1
Bariaco	E	4	U	Y	F	1
Beaked-rush, Knieskern's	T	5	S	N	T/A	1
Beardtongue, Penland	E	6	S	Y	F	2
Bear-poppy, dwarf	E	6	D	Y	F	1
Beauty, Harper's	E	4	I	Y	F	1
Bellflower, Brooksville (=Robins')	E	4	U	N	U	1
Bidens, cuneate	E	1	S	NA	NA	4
Birch, Virginia round-leaf	E	5	I	Y	Rev	3
Bird's-beak, palmate-bracted	E	1	D	N	U	1
Bird's-beak, salt marsh	E	1	U	Y	F	1
Birds-in-a-nest, white	T	4	D	N	U	1
Bittercress, small-anthered	E	4	D	Y	F	1
Bladderpod, Dudley Bluffs	T	6	S	N	A	1
Bladderpod, lyrate	T	4	S	N	U	1
Bladderpod, Missouri	E	3	I	Y	F	2
Bladderpod, white	E	2	D	N	U	1
Blazing-star, Ash Meadows	T	1	U	Y	F	1
Blazingstar, Heller's	T	4	U	Y	F	1
Blazingstar, scrub	E	4	D	Y	F	3
Blue-star, Kearney's	E	2	U	N	T/A	1
Bluegrass, Hawaiian	E	1	U	N	U	1
Bluet, Roan Mountain	E	4	U	N	T	1
Bonamia, Florida	T	4	D	Y	F	3
Boxwood, Vahl's	E	4	U	Y	F	1
Broom, San Clemente Island	E	1	S	Y	F	4
Buckwheat, steamboat	E	1	D	N	U	1
Bulrush, northeastern (=barbed bristle)	E	5	S	N	T/A	1
Bush-clover, prairie	T	3	I	Y	F	2

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Bush-mallow, San Clemente Island	E	1	I	Y	F	4
Buttercup, autumn	E	6	S	Y	F	1
Buttons, Mohr's Barbara's	T	4	S	Y	F	1
Cactus, Arizona hedgehog	E	2	U	N	U	1
Cactus, Bakersfield	E	1	D	N	U	1
Cactus, black lace	E	2	D	Y	F	1
Cactus, Brady pincushion	E	2	U	Y	F	1
Cactus, bunched cory	T	2	U	Y	F	1
Cactus, Chisos Mountain hedgehog	T	2	D	N	U	1
Cactus, Cochise pincushion	T	2	S	N	U	1
Cactus, Knowlton	E	2	S	Y	F	2
Cactus, Kuenzler hedgehog	E	2	S	Y	F	1
Cactus, Lee pincushion	T	2	S	Y	F	2
Cactus, Lloyd's hedgehog	E	2	U	NA	NA	4
Cactus, Lloyd's Mariposa	T	2	U	Y	F	1
Cactus, Mesa Verde	T	2	S	Y	F	1
Cactus, Nellie cory	E	2	U	Y	F	1
Cactus, Nichol's Turk's head	E	2	U	Y	F	2
Cactus, Peebles Navajo	E	2	U	Y	F	1
Cactus, San Rafael	E	6	D	N	U	1
Cactus, Siler pincushion	E	2	I	Y	F	3
Cactus, Sneed pincushion	E	2	D	Y	F	2
Cactus, spineless hedgehog	E	6	I	Y	F	4
Cactus, Tobusch fishhook	E	2	I	Y	F	1
Cactus, Uinta Basin hookless	T	6	S	Y	F	4
Cactus, Wright fishhook	E	6	S	Y	F	3
Campion, fringed	E	4	D	N	U	1
Capa rosa	E	4	U	N	U	1
Cassia mirabilis (=Sci. name)	E	4	D	N	U	1
Cats-eye, Terlingua Creek	E	2	U	N	U	1
Centaury, spring-loving	T	1	S	Y	F	2
Chaffseed, American	E	5	D	N	U	1
Chamaesyce halemanui (=Sci. name)	E	1	U	N	U	1
Checker-mallow, pedate	E	1	D	N	U	1
Cinquefoil, Robbins'	E	5	S	Y	F	3
Cliffrose, Arizona	E	2	D	N	U	1
Clover, running buffalo	E	3	I	Y	F	1
Cobana negra	T	4	U	N	U	1
Coneflower, Tennessee purple	E	4	S	Y	Rev	3
Coyote-thistle, Loch Lomond	E	1	S	NA	NA	4
Cranichis ricartii (=Sci. name)	E	4	U	N	U	1
Cyanea macrostegia ssp. gibsonii (=Sci. name)	E	1	U	N	U	1
Cyanea superba (=Sci. name)	E	1	U	N	U	1
Cyanea undulata (=Sci. name)	E	1	U	N	U	1
Cycladenia, Jones	T	6	U	N	U	1
Cypress, Santa Cruz	E	1	S	N	U	1
Daisy, lakeside	T	3	S	Y	F	2
Daisy, Maguire	E	6	S	N	U	4
Daphnopsis hellerana (=Sci. name)	E	4	D	Y	F	1
Dawn-flower, Texas prairie (Texas bitterweed)	E	2	D	Y	F	1
Desert-parsley, Bradshaw's	E	1	D	N	U	1
Diellia falcata (=Sci. name)	E	1	S	N	U	1
Dogweed, ashy	E	2	D	Y	F	1

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Dropwort, Canby's	E	4	D	Y	F	1
Dubautia latifolia (=Sci. name)	E	1	U	N	U	1
Dubautia pauciflorula (=Sci. name)	E	1	U	N	U	1
Erubia	E	4	D	Y	F	1
Evening-primrose, Antioch Dunes	E	1	D	Y	Rev	2
Evening-primrose, Eureka Valley	E	1	S	Y	F	2
Evening-primrose, San Benito	T	1	U	N	A	1
Fern, Alabama streak-sorus	T	4	U	N	U	1
Fern, American hart's-tongue	T	4	D	N	A	1
Fern, elfin tree	E	4	D	Y	F	1
Fiddleneck, large-flowered	E	1	I	N	A	2
Fleabane, Zuni (=rhizome)	T	2	S	Y	F	2
Four-o'clock, MacFarlane's	E	1	I	Y	F	3
Frankenia, Johnston's	E	2	I	Y	F	1
Fringe-tree, pygmy	E	4	D	Y	F	2
Gahnia lanaiensis (=Sci. name)	E	1	U	N	U	1
Gardenia, Hawaiian (na'u)	E	1	S	N	A	1
Geocarpon minimum (=Sci. name)	T	4	S	N	A	1
Geranium, Hawaiian red-flowered	E	1	U	N	U	1
Gerardia, sandplain	E	5	S	Y	F	1
Gilia, Monterey	E	1	D	N	U	1
Globe-berry, Tumamoc	E	2	I	NA	NA	4
Goetzea, beautiful (matabuey)	E	4	D	Y	F	1
Goldenrod, Blue Ridge	T	4	U	Y	F	1
Goldenrod, Houghton's	T	3	S	N	A	1
Goldenrod, Short's	E	4	S	Y	F	3
Goldenrod, white-haired	T	4	S	N	A	1
Goldfields, Burke's	E	1	D	N	U	1
Gooseberry, Miccosukee	T	4	S	NA	NA	1
Gouania hillebrandii (=Sci. name)	E	1	S	Y	F	1
Gouania meyerii (=Sci. name)	E	1	U	N	U	1
Grass, Eureka Dune	E	1	S	Y	F	2
Grass, Solano	E	1	U	Y	F	3
Grass, Tennessee yellow-eyed	E	4	U	N	U	1
Ground-plum, Guthrie's	E	4	D	N	U	1
Groundsel, San Francisco Peaks	T	2	U	Y	F	2
Gumplant, Ash Meadows	T	1	S	Y	F	2
Haha (Cyanea lobata)	E	1	U	N	U	1
Haha (Cyanea mceldowneyi)	E	1	U	N	U	1
Haha (Cyanea pinnatifida)	E	1	U	N	U	1
Ha'iwale	E	1	U	N	U	1
Haplostachys haplostachya var. angustifolia	E	1	I	N	U	1
Harperella	E	5	S	Y	F	1
Heartleaf, dwarf-flowered	T	4	I	N	U	1
Heather, mountain golden	T	4	D	Y	F	1
Hedyotis degeneri (=Sci. name)	E	1	U	N	U	1
Hedyotis, Na Pali beach	E	1	U	N	U	1
Hedyotis parvula (=Sci. name)	E	1	U	N	U	1
Hesperomannia arbuscula (=Sci. name)	E	1	U	N	U	1
Hesperomannia lydgatei (=Sci. name)	E	1	U	N	U	1
Higo chumbo	T	4	D	N	U	1
Higuero de Sierra	E	4	D	Y	F	1
Holly, Cook's	E	4	D	Y	F	1

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Hypericum, highlands scrub	E	4	D	Y	F	2
'Ihi'ihi	E	1	U	N	U	1
Ilex sintenisii (=Sci. name)	E	4	U	N	U	1
Iliau, dwarf	E	1	U	N	U	1
Iris, dwarf lake	T	3	S	N	T	1
Irisette, white	E	4	U	N	U	1
Ivesia, Ash Meadows	T	1	S	Y	F	2
Jewelflower, California	E	1	D	N	U	1
Joint-vetch, sensitive	T	5	D	N	U	1
Kamakahala	E	1	U	N	U	1
Kauai hau kuahiwi	E	1	D	N	U	1
Kio'ele	E	1	U	N	U	1
Koki'o (hau-hele'ula or Hawaii tree cotton)	E	1	S	N	U	1
Koki'o, Cooke's	E	1	E	N	U	1
Ko'oko'olau	E	1	U	N	U	1
Ko'oloa'ula	E	1	I	N	U	1
Kulu'i	E	1	U	N	U	1
Ladies'-tresses, Navasota	E	2	S	Y	RU	1
Ladies'-tresses, Ute	T	6	U	N	U	1
Lagu, Hayun (Guam), Tron Kon guafi (Rota)	E	1	S	N	U	1
Larkspur, San Clemente Island	E	1	I	Y	F	4
Layia, beach	E	1	D	N	U	1
Lead-plant, crenulate	E	4	S	Y	F	1
Leather flower, Alabama	E	4	S	Y	F	1
Leather flower, Morefield's	E	4	D	N	U	1
Lepanthes eltorensis (=Sci. name)	E	4	U	N	U	1
Liliwai	E	1	U	N	U	1
Lily, Minnesota trout	E	3	I	Y	F	2
Lipochaeta venosa (=Sci. name)	E	1	S	N	U	1
Liveforever, Santa Barbara Island	E	1	S	Y	F	1
Lobelia niihauensis (=Sci. name)	E	1	U	N	U	1
Locoweed, Fassett's	T	3	S	Y	F	2
Loosestrife, rough-leaved	E	4	U	N	T	1
Lousewort, Furbish	E	5	S	Y	Rev	2
Lupine, clover	E	1	D	N	U	1
Lupine, scrub	E	4	D	Y	F	2
Lysimachia lydgatei (=Sci. name)	E	1	U	N	U	1
Mahoe	E	1	U	N	U	1
Mallow, Kern	E	1	D	N	U	1
Mallow, Peter's Mountain	E	5	I	Y	F	3
Manioc, Walker's	E	2	S	N	U	1
Manzanita, Presidio (=Raven's)	E	1	I	Y	F	2
Ma'oli'oli	E	1	U	N	U	1
Meadowfoam, Butte County	E	1	D	N	U	1
Meadowfoam, Sebastopol	E	1	D	N	U	1
Meadowrue, Cooley's	E	4	U	N	T	1
Milkpea, Small's	E	4	D	Y	F	1
Milk-vetch, Ash Meadows	T	1	S	Y	F	2
Milk-vetch, heliotrope	T	6	U	N	U	1
Milk-vetch, Jesup's	E	5	S	Y	F	1
Milk-vetch, Mancos	E	2	D	Y	F	1
Milk-vetch, Osterhout	E	6	D	Y	F	2
Milk-vetch, Sentry	E	2	D	N	U	1

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Milkweed, Mead's	T	3	U	N	T	1
Milkweed, Welsh's	T	6	D	Y	F	1
Mint, Garrett's	E	4	S	Y	F	1
Mint, Lakela's	E	4	D	Y	F	1
Mint, longspurred	E	4	S	Y	F	1
Mint, San Diego mesa	E	1	D	Y	F	2
Mint, scrub	E	4	D	Y	F	1
Monkey-flower, Michigan	E	3	S	N	T/A	1
Monkshood, northern wild	T	3	I	Y	RU	[illegible]
Mustard, Carter's	E	4	D	Y	F	1
Mustard, slender-petaled	E	1	S	N	U	1
Na'ena'e	E	1	U	N	U	1
Naupaka, dwarf	E	1	S	N	U	1
Nehe (Lipochaeta kamolensis)	E	1	U	N	U	1
Nehe (Lipochaeta lobata var. leptophylla)	E	1	U	N	U	1
Nehe (Lipochaeta tenuifolia)	E	1	U	N	U	1
Neraudia angulata (=Sci. name)	E	1	U	N	U	1
Niterwort, Amargosa	E	1	S	Y	F	2
Nohoanu	E	1	U	N	U	1
Oak, Hinckley's	T	2	D	Y	F	1
'Oha wai	E	1	U	N	U	1
Opuhe	E	1	U	N	U	1
Orchid, eastern prairie fringed	T	3	S	N	T/A	1
Orchid, western prairie fringed	T	3	S	N	T	1
Paintbrush, San Clemente Island Indian	E	1	I	Y	F	1
Palma de manaca	T	4	U	Y	F	2
Palo colorado	E	4	U	N	U	1
Palo de jazmin	E	4	U	N	U	1
Palo de Nigua	E	4	U	Y	F	1
Palo de Ramon	E	4	D	Y	F	1
Palo de rosa	E	4	D	N	U	1
Pamakani	E	1	U	N	U	1
Panicgrass, Carter's	E	1	S	N	U	1
Pawpaw, beautiful	E	4	D	Y	F	2
Pawpaw, four-petal	E	4	D	Y	F	1
Pawpaw, Rugel's	E	4	D	Y	F	1
Pelos del diablo	E	4	D	N	U	1
Pennyroyal, McKittrick	T	2	I	Y	F	4
Pennyroyal, Todsen's	E	2	I	Y	F	1
Penstemon, blowout	E	6	S	Y	F	2
Peperomia, Wheeler's	E	4	U	Y	F	1
Phacelia, clay	E	6	D	Y	F	1
Phacelia, North Park	E	6	U	Y	F	2
Phlox, Texas trailing	E	2	S	N	A	1
Phyllostegia glabra var. lanaiensis (=Sci. name)	E	1	U	N	U	1
Phyllostegia mollis (=Sci. name)	E	1	U	N	U	1
Pink, swamp	T	5	S	Y	F	1
Pinkroot, gentian	E	4	D	N	U	1
Pitaya, Davis' green	E	2	U	Y	F	1
Pitcher-plant, Alabama canebrake	E	4	D	N	A	1
Pitcher-plant, green	E	4	I	Y	Rev	2
Pitcher-plant, mountain sweet	E	4	D	Y	F	1
Plum, scrub	E	4	D	Y	F	4

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Poa siphonoglossa (=Sci. name)	E	1	U	N	U	1
Pogonia, small whorled	E	5	I	Y	RT/A	3
Polygala, tiny	E	4	S	Y	F	1
Pondberry	E	4	D	N	A	1
Pondweed, Little Aguja	E	2	D	N	U	1
Poppy-mallow, Texas	E	2	D	Y	RU	1
Potato-bean, Price's	T	4	U	N	T/A	1
Prairie-clover, leafy	E	4	D	N	U	1
Prickly-apple, fragrant	E	4	D	Y	F	1
Prickly-ash, St. Thomas	E	4	D	Y	F	1
Prickly-poppy, Sacramento	E	2	U	N	U	1
Primrose, Maguire	T	6	D	Y	F	2
Quillwort, black-spored	E	4	D	N	A	1
Quillwort, mat-forming	E	4	D	N	A	1
Rattleweed, hairy	E	4	D	Y	F	1
Reed-mustard, Barneby	E	6	D	N	U	1
Reed-mustard, clay	T	6	U	N	U	1
Reed-mustard, shrubby (toad-flax cress)	E	6	D	N	U	1
Remya kauaiensis (=Sci. name)	E	1	U	N	U	1
Remya, Maui	E	1	U	N	U	1
Remya montgomeryi (=Sci. name)	E	1	U	N	U	1
Rhododendron, Chapman	E	4	D	Y	F	1
Ridge-cress (=peppercress), Barneby	E	6	D	N	A	1
Rock-cress, McDonald's	E	1	S	Y	F	3
Rock-cress, shale barren	E	5	S	Y	F	1
Rosemary, Cumberland	T	4	D	N	U	1
Roseroot, Leedy's	T	3	S	N	U	1
Rush-pea, slender	E	2	D	Y	F	1
Sand-verbena, large-fruited.	E	2	D	Y	F	1
Sandalwood, Lanai ('iliahi)	E	1	S	N	U	1
Sandwort, Cumberland	E	4	U	N	U	1
Sanicula mariversa (=Sci. name)	E	1	U	N	U	1
Schiedea, Diamond Head	E	1	S	N	U	1
Schiedea haleakalensis (=Sci. name)	E	1	U	N	U	1
Schiedea kaalae (=Sci. name)	E	1	U	N	U	1
Schoepfia arenaria (=Sci. name)	E	4	U	Y	F	1
Sedge, Navajo	T	2	U	Y	F	2
Shield-fern, Aleutian (Aleutian holly-fern)	E	7	S	Y	F	1
Silene perlmanii (=Sci. name)	E	1	U	N	U	1
Silversword, Haleakala ('ahinahina)	T	1	U	N	U	1
Silversword, Mauna Kea ('ahinahina)	E	1	S	N	T/A	1
Skullcap, Florida	T	4	D	N	U	1
Skullcap, large-flowered	E	4	U	N	U	1
Snakeroot	E	4	D	Y	F	1
Snowbells, Texas	E	2	D	Y	F	1
Spineflower, Howell's	E	1	D	N	U	1
Spineflower, slender-horned	E	1	D	N	U	1
Spineflower, Sonoma	E	1	D	N	U	1
Spiraea, Virginia	T	5	S	N	A	1
Spurge, deltoid	E	4	D	Y	F	1
Spurge, Garber's	T	4	S	Y	F	1
Spurge, telephus	T	4	D	N	U	1
Stenogyne angustifolia var. angustifolia(=Sci. name)	E	1	S	N	U	1

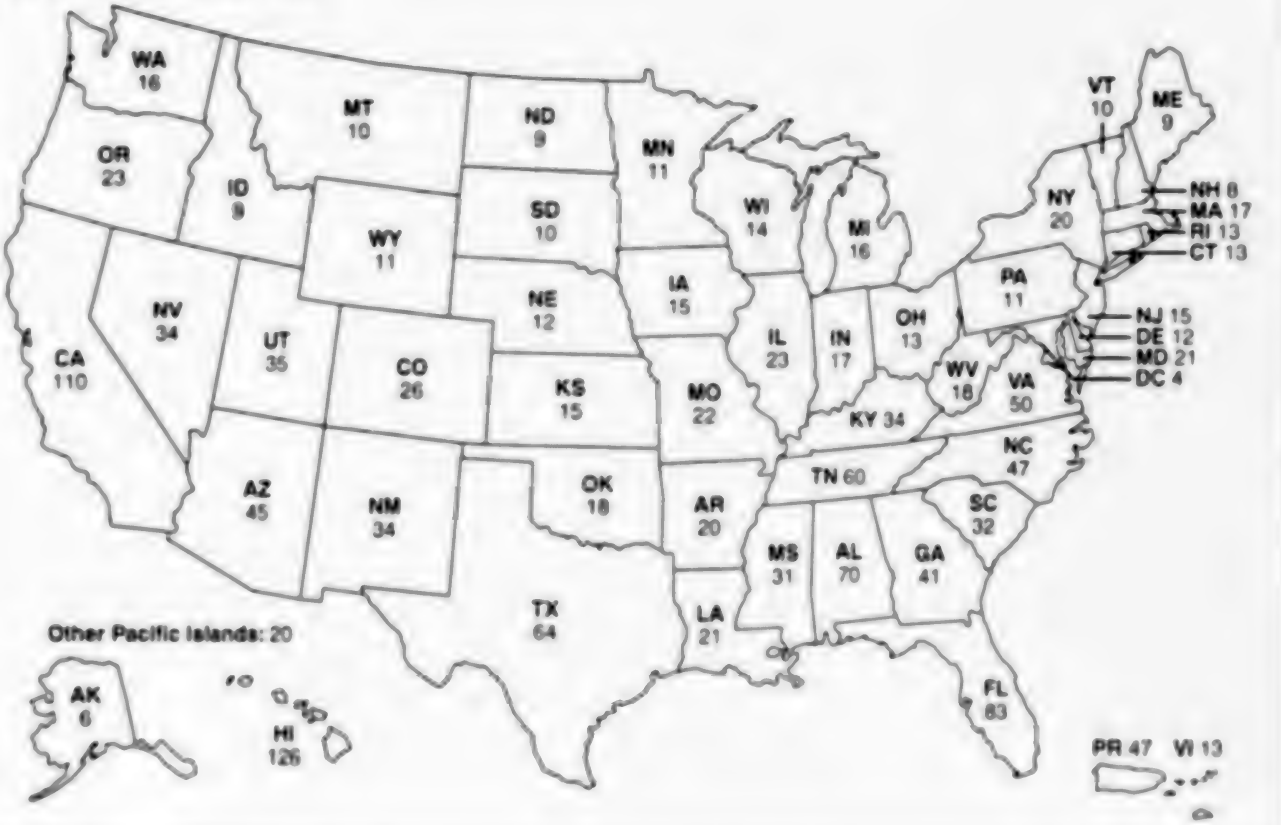
Listed Species	*Listed As*	*Lead Region*	*Status*	*Rec. Plan*	*Plan Stage*	*Recovery Achieved*
Stenogyne campanulata (=Sci. name)	E	1	U	N	U	1
Stenogyne kanehoana (=Sci. name)	E	1	U	N	U	1
Sumac, Michaux's	E	4	D	N	A	1
Sunflower, Schweinitz's	E	4	D	N	T	1
Sunray, Ash Meadows	T	1	S	Y	F	2
Sunshine, Sonoma (Baker's stickyseed)	E	1	D	N	U	1
Ternstroemia subsessilis (=Sci. name)	E	4	U	N	U	1
Tetramolopium filiforme (=Sci. name)	E	1	U	N	U	1
Tetramolopium lepitodum var. lepitodum (=Sci. name)	E	1	U	N	U	1
Tetramolopium remyi (=Sci. name)	E	1	U	N	U	1
Thistle, Pitcher's	T	3	S	N	T/A	1
Thistle, Sacramento Mountains	T	2	S	N	T/A	1
Thornmint, San Mateo	E	1	D	N	U	1
Torreya, Florida	E	4	D	Y	F	1
Townsendia, Last Chance	T	6	U	N	A	1
Tree-cactus, Key	E	4	S	Y	F	2
Trillium, persistent	E	4	S	Y	F	1
Trillium, relict	E	4	D	Y	F	1
Twinpod, Dudley Bluffs	T	6	S	N	A	2
Uhiuhi	E	1	D	N	U	1
Vetch, Hawaiian	E	1	S	Y	F	1
Viola helenae (=Sci. name)	E	1	U	N	U	1
Viola lanaiensis (=Sci. name)	E	1	U	N	U	1
Wallflower, Contra Costa	E	1	I	Y	Rev	2
Wallflower, Menzies'	E	1	D	N	U	1
Warea, wide-leaf	E	4	D	N	T/A	1
Water-plantain, Kral's	T	4	S	Y	F	1
Water-willow, Cooley's	E	4	U	N	U	1
Wawa'iole	E	1	U	N	U	1
Whitlow-wort, papery	T	4	D	Y	F	3
Wild-buckwheat, clay-loving	E	6	S	Y	F	1
Wild-buckwheat, gypsum	T	2	S	Y	F	2
Wild-rice, Texas	E	2	D	Y	RU	1
Wire-lettuce, Malheur	E	1	U	Y	F	2
Wireweed	E	4	D	Y	F	4
Woolly-star, Hoover's	T	1	S	N	U	1
Woolly-star, Santa Ana River	E	1	D	N	U	1
Wooly-threads, San Joaquin	E	1	D	N	U	1
Xylosma crenatum (=Sci. name)	E	1	U	N	U	1
Ziziphus, Florida	E	4	D	Y	F	1

Listed Species and Selected Species Highlights by State

This section of the report indexes all listed species by State(s) and/or Trust Territory of occurrence and indicates whether the species is listed as endangered or threatened. This section also includes selected species highlights.

Maps included in this section indicate the counties of *known* occurrence for species. In certain instances, species may be extirpated from the wild in the featured State; in these cases, a blank map of the State will be shown. For multi-species accounts, counties where one or more of the featured species occur are indicated.

Listed Species by State/Territory
As of September 30, 1992



The total number of endangered and threatened species that occur in each State are provided here. Species under the jurisdiction of both the Fish and Wildlife Service and the National Marine Fisheries Service are included in the totals; however, species listed as endangered or threatened by "similarity of appearance" and some extirpated species are not.

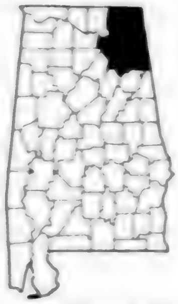
Alabama

Species Name	*Status*
Bat, gray	E
Bat, Indiana	E
Mouse, Alabama beach	E
Mouse, Perdido Key beach	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Stork, wood	E
Woodpecker, red-cockaded	E
Snake, eastern indigo	T
Tortoise, gopher	T
Turtle, Alabama red-bellied	E
Turtle, flattened musk	T
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, Kemp's (=Atlantic) ridley sea	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Salamander, Red Hills	T
Cavefish, Alabama	E
Darter, amber	E
Darter, boulder (=Elk River)	E
Darter, goldline	T
Darter, slackwater	T
Darter, snail	T
Darter, watercress	E
Sculpin, pygmy	T
Shiner, blue	T
Shiner, Cahaba	E
Sturgeon, Gulf	T
Snail, tulotoma (=Alabama live-bearing)	E
Fanshell	E
Heelsplitter, inflated	T
Mussel, Curtus'	E
Mussel, Judge Tait's	E
Mussel, Marshall's	E
Mussel, penitent	E
Mussel, ring pink (=golf stick pearly)	E
Pearly mussel, Alabama lamp	E
Pearly mussel, cracking	E
Pearly mussel, Cumberland monkeyface	E
Pearly mussel, little-wing	E
Pearly mussel (=pimple back), orange-footed	E
Pearly mussel, pale lilliput	E
Pearly mussel, pink mucket	E
Pearly mussel, purple cat's paw	E
Pearly mussel, turgid-blossom	E
Pearly mussel, white wartyback	E
Pearly mussel, yellow-blossom	E
Pigtoe, fine-rayed	E
Pigtoe, shiny	E
Stirrup shell	E
Shrimp, Alabama cave	E
Amphianthus, little	T
Bladderpod, lyrate	T
Buttons, Mohr's Barbara's	E
Fern, Alabama streak-sorus	T
Fern, American hart's-tongue	T
Grass, Tennessee yellow-eyed	E
Harperella	E
Leather flower, Alabama	E
Leather flower, Morefield's	E
Pitcher-plant, green	E
Pitcher-plant, Alabama canebrake	E
Pondberry	E
Potato-bean, Price's	T
Prairie-clover, leafy	E
Trillium, relict	E
Water-plantain, Kral's	T

Alabama

Green Pitcher-plant

(*Sarracenia oreophila*)—Endangered



Current Status: Conversion of land for agricultural and residential development has destroyed or damaged habitat supporting green pitcher-plant populations, many of them already critically small in number. Fire suppression and collecting have reduced other populations.

Achievements: Green pitcher-plant numbers have increased at several locations. The discovery of additional populations brings the Alabama total to 32, 2 of which have received permanent protection through land acquisition by The Nature Conservancy. Thirteen others have short-term protection through voluntary Conservation Agreements between private landowners and conservation groups, such as The Nature Conservancy, State natural resource agencies, and local land trust organizations. With landowner approval, green pitcher-plant populations are visited several times a year to count flowers and fruits, measure cover/frequency, and assess the effects of the management program. Habitat analysis has been carried out for all populations. Other projects include prescribed burns, transplantation experiments, reestablishment of a colony in Cherokee County, and surveys to locate additional populations.

Current Recovery Needs: Continued monitoring, habitat protection and management, and surveys for additional populations are needed for recovery.

Partnerships

Alabama Forestry Commission: The Commission manages habitat for 15 colonies, where prescribed burns have been conducted since 1986.

Alabama Department of Conservation and Natural Resources (Alabama Natural Heritage Program): Since 1991, this agency has helped the Forestry Commission design management plans for pitcher-plant populations. Surveys for new populations are ongoing.

Alabama Power Company: Several populations on company property have been protected, and one site is monitored annually.

The Nature Conservancy: The local chapter of the Conservancy protects and manages two sites containing green pitcher-plants.

Recovery Plan Status: Original plan approved 5/11/83; revised 4/5/85.

Donald E. Schell

Alaska

Species Name	*Status*
Curlew, Eskimo	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Goose, Aleutian Canada	T
Shield-fern, Aleutian (Aleutian holly-fern)	E

Aleutian Canada Goose

(*Branta canadensis leucopareia*)—Threatened

Current Status: Aleutian Canada goose nesting populations, which consist of more than 20 nesting pairs each, occur on only 4 islands. The restricted nesting range makes the impact of disease or other random events potentially severe for the overall population. Nesting groups in the Central Aleutians and Semidi Islands remain dangerously small. Introduced foxes, predators of the goose, remain on many of the former nesting islands.

Achievements: Aleutian Canada geese have responded so well to management throughout their range that the species' status was reclassified in 1990 from endangered to threatened. Fox removal and the closure on hunting Aleutian Canada geese have increased the number of successful nesting islands from three to nine. In addition, the first instance of Aleutian Canada geese moving from one island to settle on another was documented in the Semidi Islands. Based on the 1991/1992 winter estimate, the population has increased to approximately 7,900 birds, exceeding the recovery plan population goal for delisting even though difficulties with safeguarding the species' wintering grounds in California and Oregon prevent delisting at this time (most Aleutian Canada goose winter habitat is on private lands where agriculture practices and urbanization continue to threaten the geese). Informal section 7 consultations have been completed or are ongoing for military operations on Adak, Amchitka, and Shemya Islands. Nesting and brood surveys, color marking, and surveys for suitable future release sites also have been conducted.

Current Recovery Needs: Nesting surveys, habitat mapping, color marking, additional fox removal, and identification of future release sites are needed, as well as studies to determine the impact of introduced rats and native eagles on goose translocation.

Partnerships

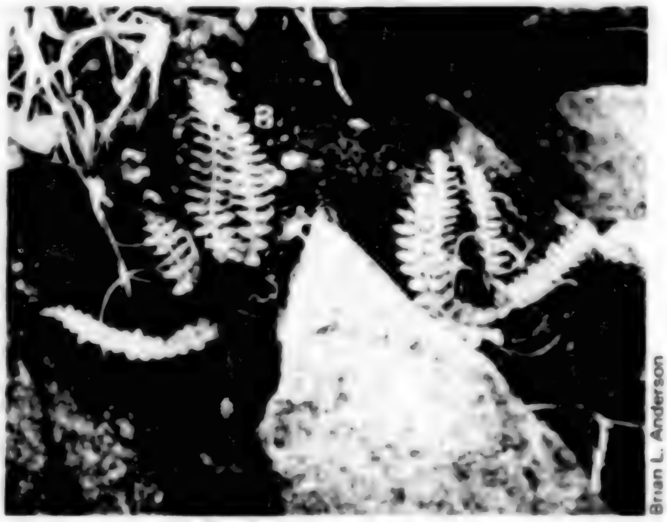
Alaska Department of Fish and Game: The Department is maintaining hunting closures to protect migrating Aleutian Canada geese.

Recovery Plan Status: Original plan approved 3/7/79; revised 9/30/91.

FWS File Photo

Aleutian Shield-fern

(*Polystichum aleuticum*)—Endangered



Brian L. Anderson

Current Status: Occurring only on Adak Island, the small population of approximately 112 individuals is vulnerable to collecting, grazing by introduced ungulates, landslides, and other random events.

Achievements: The first systematic monitoring of the wild population was completed in 1991. Spores from the Aleutian shield-fern have been germinated in the greenhouse at the University of Alaska at Fairbanks, yielding approximately 1,700 immature plants. In 1992, the first attempts to maintain these immature plants outdoors were made.

Current Recovery Needs: Taxonomic investigations, including genetic analyses, are needed to verify the origin of the species, and breeding biology studies may show why the fern is so rare.

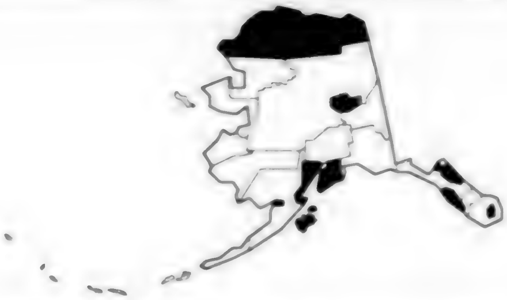
Partnerships

University of Alaska at Fairbanks: The University maintains a greenhouse fern population and conducts ongoing research.

Recovery Plan Status: Plan approved 9/30/92.

American Peregrine Falcon

(*Falco peregrinus anatum*)—Endangered



Current Status: The Fish and Wildlife Service is considering reclassification of this subspecies. Although restricted in the United States and Canada, pesticides containing DDT continue to be used in Central and South American countries through which Northern American peregrine falcons migrate and spend winter months. Peregrine falcons prey primarily on birds, many of which also migrate through and winter in Central and South America. Habitat contamination and destruction in these countries threaten peregrines and their prey.

Achievements: With the introduction of DDT in the 1940s, American peregrine falcons began to decline until by the mid-1970s their numbers had decreased to approximately 20 percent of historical levels. In 1973, the United States and Canada restricted the use of DDT, causing northern populations to increase. Some now approach historical levels, but others are recovering more slowly. The Fish and Wildlife Service conducts about 150 informal section 7 consultations and 2 formal ones annually, primarily in connection with Army Corps of Engineers permits, but also including the Bureau of Land Management and the Geological Survey.

Current Recovery Needs: Recovery actions focus on monitoring occupancy rates, productivity, mortality, and contaminant levels, as well as determining migration routes and wintering areas.

Section 6 Funding and Activities: Approximately $19,000 annually in section 6 funds have been used to survey areas where development is likely and where baseline data for Arctic and American peregrine falcons are lacking.

Partnerships

Bureau of Land Management and National Park Service: Since the early 1980s, the Bureau of Land Management, National Park Service, and Fish and Wildlife Service have collected data on American peregrine falcon recovery in interior Alaska, specifically population numbers and productivity. Contaminant levels, migration routes, and wintering areas also are being studied.

Alaska Department of Fish and Game: The Department conducts surveys in areas of potential development to obtain baseline information on falcons.

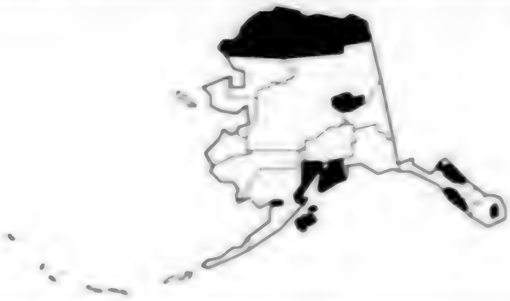
Recovery Plan Status: Plan approved 10/4/82.

FWS File Photo

Alaska

Arctic Peregrine Falcon

(*Falco peregrinus tundrius*)—Threatened



Current Status: The Fish and Wildlife Service is considering delisting this subspecies. Although restricted in the United States and Canada, pesticides containing DDT continue to be used in Central and South American countries through which Arctic peregrine falcons migrate and spend winter months. Peregrines prey primarily on birds, many of which also migrate through and winter in Central and South America. Habitat contamination and destruction in these countries threaten peregrines and their prey.

Achievements: With the introduction of DDT in the 1940s, Arctic peregrine falcons began to decline until by the mid-1970s their numbers had decreased to approximately 20 percent of historical levels. In 1973, the United States and Canada restricted DDT use, causing northern populations to increase. Some now approach historical levels, but others are recovering more slowly. The Fish and Wildlife Service conducts about 50 informal section 7 consultations and 2 formal ones annually, primarily in connection with Army Corps of Engineers permits, but also including the Bureau of Land Management and the Geological Survey.

Current Recovery Needs: Recovery actions focus on monitoring occupancy rates, productivity, mortality, and contaminant levels, as well as determining migration routes and wintering areas.

Section 6 Funding and Activities: Approximately $20,000 annually in section 6 funds have been used to survey areas where development is likely and where baseline data for Arctic and American peregrine falcons are lacking.

Partnerships

Bureau of Land Management: Since the early 1980s, the Bureau of Land Management and the Fish and Wildlife Service have cooperated on surveys along the Colville and Sagavanirktok Rivers in northern Alaska, two index study areas identified in the Peregrine Falcon Recovery Plan for the Alaska population. The surveys are providing information on falcon population numbers and productivity. Contaminant levels, migration routes, and wintering areas also are being studied.

Alaska Department of Fish and Game: The Department conducts surveys in areas of potential development to obtain baseline information on falcons.

Recovery Plan Status: Plan approved 10/4/82.

Ted Swem

Arizona

Species Name	*Status*
Bat, Sanborn's long-nosed	E
Jaguarundi	E
Ocelot	E
Pronghorn, Sonoran	E
Squirrel, Mount Graham red	E
Vole, Hualapai Mexican	E
Bobwhite, masked (quail)	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Rail, Yuma clapper	E
Tortoise, desert	T
Catfish, Yaqui	T
Chub, bonytail	E
Chub, humpback	E
Chub, Sonora	T
Chub, Virgin River	E
Chub, Yaqui	E
Minnow, loach	T
Pupfish, desert	E
Shiner, beautiful	T
Spikedace	T
Spinedace, Little Colorado	T
Squawfish, Colorado	E
Sucker, razorback	E
Topminnow, Gila (incl. Yaqui)	E
Trout, Apache (=Arizona)	T
Trout, Gila	E
Woundfin	E
Ambersnail, Kanab	E
Agave, Arizona	E
Blue-star, Kearney's	E
Cactus, Cochise pincushion	T
Cactus, Nichol's Turk's head	E
Cactus, Arizona hedgehog	E
Cactus, Brady pincushion	E
Cactus, Peebles Navajo	E
Cactus, Siler pincushion	E
Cliffrose, Arizona	E
Cycladenia, Jones	T
Globe-berry, Tumamoc	E
Groundsel, San Francisco Peaks	T
Milk-vetch, Sentry	E
Milkweed, Welsh's	T
Sedge, Navajo	T

Colorado River Fishes

Species:
Colorado Squawfish (*Ptychocheilus lucius*)—Endangered
Humpback Chub (*Gila cypha*)—Endangered
Bonytail Chub (*Gila elegans*)—Endangered
Razorback Sucker (*Xyrauchen texanus*)—Endangered

Current Status: Captive populations of Colorado squawfish, bonytail chub, and razorback sucker are maintained at the Dexter National Fish Hatchery and Technology Center. In the wild, Colorado squawfish occur in the Salt and Verde Rivers; both populations are small and designated as nonessential experimental populations. Humpback chub occur in the Little Colorado River and Colorado River mainstem upstream and downstream from the mouth of the Little Colorado River. The bonytail chub population is confined to Lake Mohave, and bonytails continue to be stocked there. Fish surveys conducted annually during late winter and early spring consistently yield a few bonytail chubs; the population is believed to be small, but continues to survive. Most of the "Arizona" razorback sucker population, some 60,000 fish, reside in Lake Mohave. These fish are more than 40 years old; as a result, the population could crash at any time. Several factors threaten all four species, including destruction of floodplain habitat, reduction of spring flows, alteration of natural hydrography, flow fluctuations for hydropower production, fish passage barriers, cold water temperatures below mainstem reservoirs, competition with and predation by nonnative fishes, and contaminants.

Achievements: Implementation of a spawning and rearing program at Lake Mohave shows promise. In the spring of 1992, 90 adult razorback suckers were moved to a "predator free" pond on the banks of Lake Mohave. These fish were allowed to spawn naturally and the progeny survived on food that occurred naturally in the pond. By the end of the summer, 300 young razorbacks had been tagged and either placed into a protected cover for further growth or released directly into Lake Mohave. The facilities in the cove have now been expanded to include bonytail chub. Both species will be released into Lake Mohave soon after they reach 300 millimeters total length. Because recruitment is either very low or non-existent for these two species, the introduction of subadult fish is deemed necessary to maintain the existing population until steps can be taken to ensure that recruitment occurs naturally.

The multi-agency Glen Canyon Environmental Studies are evaluating impacts of Glen Canyon Dam operations on the environment of the Colorado River downstream of the dam, including impacts on endangered fishes. Additionally, the Native Fish Work Group was established as an advisory group for endangered fishes. The only significant section 7 consultations involve the proposed stocking of sport fishes (one is a Fish and Wildlife Service program and the other is a State program), which would use fish supplied by the Service. Biological evaluations of both proposals are under way.

Current Recovery Needs: Because of the many threats to these species, a variety of measures will be needed for their recovery, including extensive habitat restoration, control of nonnative fishes, improvements in water quality, and reintroductions of the native fishes to their historic habitats.

Section 6 Funding and Activities: In FY 1991, Arizona received $64,000 for stocking and monitoring razorback suckers and Colorado squawfish, and $10,000 for monitoring humpback chubs. In FY 1992, Arizona received $39,000 for monitoring squawfish and razorbacks.

Partnerships: Two programs are being conducted to recover the river's endangered fishes in Arizona, the Glen Canyon Environmental Studies and the Native Fish Work Group:

Glen Canyon Environmental Studies: This program is being conducted to identify the impacts of Glen Canyon Dam operations on the environmental and recreational resources of the Colorado River downstream of the dam, including impacts on endangered Colorado River fishes. Federal agencies participating include the Fish and Wildlife Service, Bureau of Reclamation, Bureau of Indian Affairs, U.S. Geological Survey, National Park Service, and Western Area Power Administration. The Arizona Game and Fish Department is also participating, as are Arizona State University and various private consultants.

Native Fish Work Group: This group recommends studies and activities believed necessary to recover fishes of the lower Colorado River basin and participates to an extent in their implementation. Federal involvement in this program includes the Fish and Wildlife Service, Bureau of Reclamation, and National Park Service. The Arizona Game and Fish Department and the Nevada Department of Wildlife Conservation also participate, along with Arizona State University and the University of Arizona.

Recovery Plan Status:

Colorado squawfish—original plan approved 3/16/78; revised 8/6/91.

Humpback chub—original plan approved 8/22/79; revised 9/19/90.

Bonytail chub—original plan approved 5/16/84; revised 9/4/90.

Razorback sucker—plan under development.

razorback sucker

humpback chub

bonytail chub

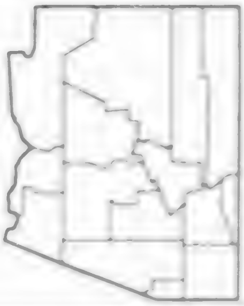
Colorado squawfish

Drawings by Dr. Robert J. Behnke

Arizona

Gray Wolf*

(*Canis lupus*)—Endangered



*Extirpated from the wild in Arizona.

Current Status: Wild populations of the subspecies of gray wolf occurring in Arizona, known as the Mexican wolf (*Canis lupus baileyi*), are extirpated in the U.S. and possibly in Mexico, but the Mexican wolf's status is improving in captivity. Threats to any wild populations include possible illegal killing, a small genetic base, and human encroachment on the remaining habitat.

Achievements: By the mid-1900s, the Mexican wolf was eliminated from the U.S. portion of its historic range. In the late 1970s, five wolves were captured in Mexico and delivered to the Arizona-Sonora Desert Museum near Tucson, Arizona, for captive propagation. The captive population has grown to 50 animals (41 in 9 facilities in the U.S. and 9 in 3 facilities in Mexico). Sperm from genetically critical males has been collected and preserved, and additional captive propagation cooperators have been recruited. Work toward a proposal to reintroduce Mexican wolves to areas within the U.S. portion of their historic range has been initiated: four potential release sites in Arizona were evaluated, four public meetings were held, and preparation of an environmental impact statement has begun. In addition, a full-time Mexican Wolf Recovery Coordinator position was established.

Current Recovery Needs: Necessary recovery actions include surveys to determine the species' status in Mexico; evaluations of sighting reports in the U.S. and follow-up surveys, if warranted; monitoring and protection of any remaining wild wolves; increasing the captive breeding population; genetically evaluating two uncertified captive populations to determine if they are pure; collecting and banking sperm for future use; reintroducing captive-bred wolves into historic habitat; monitoring and managing any reintroduced populations; conducting research on biology/ecology and artificial propagation; and continuing public education and information activities.

Partnerships

Forest Service, Department of Agriculture's Animal Damage Control Division, National Park Service, and Department of the Army: These agencies are cooperating in the preparation of the reintroduction environmental impact statement. Sites being considered for an experimental release are owned by the Forest Service, Department of the Army, and National Park Service. The Department of Agriculture's Animal Damage Control Division will play a key role in the management of any reintroduced population.

Arizona Game and Fish Department: In full coordination with the Fish and Wildlife Service, the Department has taken a leadership role in all aspects of Mexican wolf recovery in Arizona.

Arizona-Sonora Desert Museum: The Museum is a cooperator in the Mexican wolf captive propagation program.

Phoenix Zoo: The zoo is also a cooperator in the Mexican wolf captive propagation program.

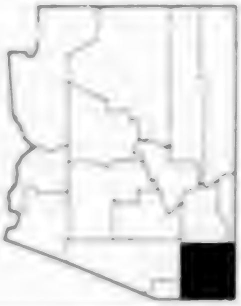
Preserve Arizona's Wolves: This private organization, also known as PAWS, is raising funds to help build another Mexican wolf breeding enclosure at the Phoenix Zoo.

Defenders of Wildlife: Defenders of Wildlife, a national conservation organization, has established a fund to compensate livestock owners for losses that may be caused by wolves if they are reintroduced.

Recovery Plan Status: Plan approved 9/15/82.

FWS File Photo

Arizona



Yaqui Catfish

(*Ictalurus pricei*)—Threatened

Current Status: Extirpated from the United States, this fish still exists in low numbers within the Rio Yaqui drainage of northern Mexico. The primary threat to this species has been hybridization with channel catfish. Pollution from timber mills, mining, and industrial and domestic sources has also had an impact.

Achievements: In 1987 and 1990, staff from the Fish and Wildlife Service's San Bernardino National Wildlife Refuge assisted staff from the Arizona Game and Fish Department and the Dexter National Fish Hatchery and Technology Center in collecting broodstock from the Rio Yaqui drainage (Rio Sirupa and Rio Aros) in Mexico. The fish's genetic compositions were determined, and it was found that some contamination with channel catfish had occurred. However, 150 of the fish have been verified as pure Yaqui catfish. Thirty have been returned to Mexico, and 120 are at the Dexter National Fish Hatchery and Technology Center for propagation in 1993.

Current Recovery Needs: Production of pure stocks of Yaqui catfish is expected to be successful, and the species should be reintroduced in 1993 into the headwaters of the Yaqui drainage system, its historic habitat in the United States. In cooperation with the Mexican government, pure stock will be provided for propagation and reintroduction into historic habitat in Mexico. Although there is no apparent solution to the problem of hybridization, reintroduction in the United States will be concentrated in areas void of channel catfish.

John N. Rinne

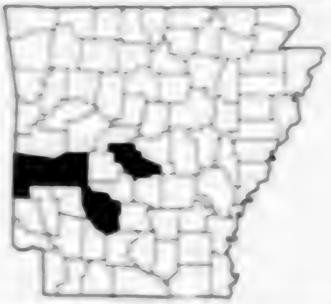
Partnerships

Republic of Mexico: The Republic of Mexico provided catfish, of unknown genetic purity, from historic streams in Mexico. In return, the United States determined the genetic composition of the fish. Channel catfish (*Ictalurus punctatus*) and hybrid fish were discarded and pure strain Yaqui catfish were either maintained in the United States or returned to Mexico for use as broodstock. The Mexican government plans to produce and reintroduce pure stock Yaqui catfish into waters where this fish historically occurred in Mexico.

Recovery Plan Status: Plan under development.

Arkansas

Species Name	*Status*
Bat, gray	E
Bat, Indiana	E
Bat, Ozark big-eared	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Tern, least (interior population)	E
Woodpecker, red-cockaded	E
Cavefish, Ozark	T
Darter, leopard	T
Sturgeon, pallid	E
Shagreen, Magazine Mountain	T
Fatmucket, Arkansas	T
Mussel, Ouachita rock-pocketbook (Wheeler's pearlymussel)	E
Pocketbook, fat	E
Pocketbook, speckled	E
Cambarus zophonastes (=Sci. name)	E
Beetle, American burying (=giant carrion)	E
Geocarpon minimum (=Sci. name)	T
Pondberry	E



Arkansas Fatmucket

(*Lampsilis powelli*)—Threatened

Current Status: The Arkansas fatmucket mussel continues to be threatened by impoundments, channel alteration, gravel dredging, sedimentation, and water quality degradation.

Achievements: A section 7 consultation with the Federal Highway Administration on a bridge project resulted in a no-jeopardy biological opinion, and a Fish and Wildlife Service recommendation to relocate the species from the site led to the successful removal of 44 individuals. One of the four remaining occupied streams was protected when a section 7 consultation with the Soil Conservation Service on a reservoir project that would have jeopardized the survival of this threatened mussel led to the proposal being dropped. In another case, a consultation with the Federal Energy Regulatory Commission on a hydropower project resulted in a no-jeopardy biological opinion.

Current Recovery Needs: Known populations of the Arkansas fatmucket and its habitat will need protection. Additionally, restoration of historic habitat and reestablishment of the mussel in its historic range is needed. Research on the species' life history is needed, as well as an evaluation of threats posed by the spread of the exotic zebra mussel.

John L. Harris

Section 6 Funding and Activities: In FY 1991 and FY 1992, the Arkansas Game and Fish Commission was provided $21,051 and $33,528, respectively, to conduct status surveys for all mussels that are listed and candidates for listing. These surveys are intended to identify important mussel resource areas in Arkansas.

Partnerships

Forest Service: This Federal agency provided funding for research of movement and survival of the Arkansas fatmucket.

Recovery Plan Status: Plan approved 2/10/92.

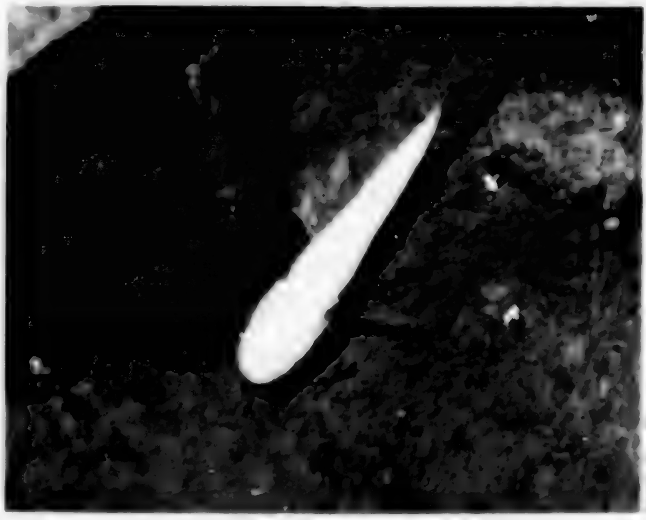
Arkansas

Ozark Cavefish

(*Amblyopsis rosae*)—Threatened

Current Status: The greatest threat to this species is habitat modification due to activities within cave recharge zones that contribute to water pollution. Increased poultry production may inject large amounts of organics and chemicals into some caves. Highway and airport construction within recharge areas may also adversely affect cavefish habitat.

Achievements: Several new populations of Ozark cavefish have been discovered and protected in Benton County, Arkansas, since this species was listed in 1984. Recharge areas have been determined for some caves, enabling enhanced protection of the aquatic system. An ongoing mark and recapture study by students from the Arkansas Cooperative Fish and Wildlife Research Unit at the University of Arkansas has demonstrated that the population within Logan Cave in Benton County is substantially larger than previous surveys have indicated.



FWS File Photo

Current Recovery Needs: This species will need continued population monitoring, and recharge areas for nine caves it inhabits will need protection to attain recovery.

Partnerships

Arkansas Game and Fish Commission: This State agency owns and protects the entrance to Beaver Lake Nursery Pond Cave in Benton County.

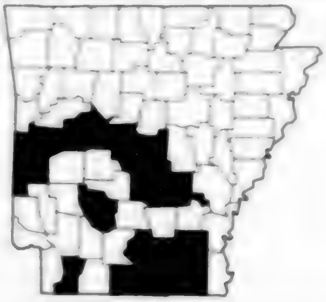
Arkansas Natural Heritage Commission: The Natural Heritage Commission owns the entrance to Cave Springs Cave in Benton County and restricts entry.

Recovery Plan Status: Original plan approved 12/17/86; revised 11/14/89.

Arkansas

Red-cockaded Woodpecker

(*Picoides borealis*)—Endangered



Current Status: Threats to the red-cockaded woodpecker (RCW) include: (1) loss of small, geographically isolated populations; (2) growth of hardwood midstory in their preferred habitat of "open" pine forests; (3) loss of nesting and foraging habitat from southern pine beetle infestations; and (4) short rotation forest management, particularly on private lands. The development of hardwood midstories in southern pine forests is directly attributable to decades of fire suppression and lack of aggressive and extensive growing season (generally April-August) prescribed burning programs. As most of the recovery populations exists on federally owned or managed lands, the Fish and Wildlife Service has been active in supporting the concept of ecosystem management and timber harvesting practices that promote species recovery and protection.

Achievements: The RCW has responded very favorably to advances in artificial cavity technology. A significant limiting factor for RCW recovery is the lack of old growth (80-120+ years) pine trees in the southeast. Artificial cavities can be provided in younger trees and thus serve as a short-term population stabilizing factor, while forests are grown to older ages. Translocation of RCWs (generally relocating a juvenile female to the established territory of a single male) is another proven management tool being used to prevent further declines of already small populations. RCWs have been moved from Texas to Arkansas to supplement the population on the Ouachita National Forest.

Artificial cavity and translocation programs can be used to stop population declines in small populations and increase the rate of population expansion in both small and large populations. Use of these management practices can reverse decades of population declines and should be fully implemented during the short-term (next 20-40 years) while forests produce the older trees needed for RCWs to survive on their own. Translocation and artificial cavity construction techniques will be employed on the Ouachita National Forest in Arkansas. The Fish and Wildlife Service is currently consulting informally with the Forest Service as it develops its regionwide (11 States with RCWs) environmental impact statement for management of the RCW. Formal consultation is expected to begin in the spring of 1993.

The Fish and Wildlife Service is currently active in discussing the applicability of a rangewide Habitat Conservation Plan for small property private landowners. Silvicultural and State forestry groups in Arkansas are interested and expected to take part in the Habitat Conservation Plan, once the concept is finalized. This would allow for incidental take of small, demographically isolated populations, which are biologically "doomed" regardless of efforts by the Service or landowners to manage and "save" them. Mitigation could include translocation of juveniles to Federal or other public properties that have conservation programs in place.

Current Recovery Needs: Recovery actions should include: (1) development of comprehensive conservation and management plans for national forests and military installations responsible for RCW recovery;

FWS File Photo

(2) halting population declines in small, non-viable populations; (3) habitat restoration and maintenance through the aggressive use of prescribed fire; and (4) development of a private lands strategy that addresses the role of private lands in RCW conservation efforts.

Partnerships

Forest Service: This Federal agency was responsible for developing artificial cavities and translocation techniques for the RCW. The Forest Service has also developed a strategy and management plan to increase the existing population of 15-20 RCW groups to 250 groups on the Ouachita National Forest.

Georgia-Pacific Corporation: Georgia-Pacific has the largest RCW population (about 50 groups) in southern Arkansas, which is currently the largest population in the State. The Fish and Wildlife Service is working with Georgia-Pacific on a comprehensive management plan for this population, as well as all RCWs it has on its 3.5 million acres of southern timberlands (including several hundred thousand acres in Arkansas). The management plan probably will take the form of a Memorandum of Understanding and will provide this industrial forest company a framework to promote conservation of RCWs while meeting private management objectives.

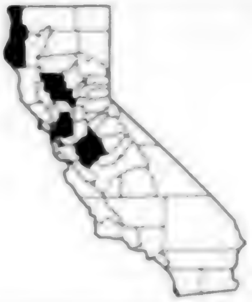
Recovery Plan Status: Original plan approved 8/24/79; revised 4/11/85.

California

Species Name	*Status*
Beaver, Point Arena mountain	E
Fox, San Joaquin kit	E
Mouse, salt marsh harvest	E
Otter, southern sea	T
Rat, Fresno kangaroo	E
Rat, giant kangaroo	E
Rat, Morro Bay kangaroo	E
Rat, Stephens' kangaroo	E
Rat, Tipton kangaroo	E
Vole, Amargosa	E
Condor, California	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Goose, Aleutian Canada	T
Owl, northern spotted	T
Pelican, brown	E
Rail, California clapper	E
Rail, light-footed clapper	E
Rail, Yuma clapper	E
Shrike, San Clemente loggerhead	E
Sparrow, San Clemente sage	T
Tern, California least	E
Towhee, Inyo California (=brown)	T
Vireo, least Bell's	E
Lizard, blunt-nosed leopard	E
Lizard, Coachella Valley fringe-toed	T
Lizard, Island night	T
Snake, San Francisco garter	E
Tortoise, desert	T
Turtle, green sea	T
Turtle, leatherback sea	E
Turtle, olive (=Pacific) ridley sea	T
Salamander, desert slender	E
Salamander, Santa Cruz long-toed	E
Chub, bonytail	E
Chub, Mohave tui	E
Chub, Owens tui	E
Pupfish, desert	E
Pupfish, Owens	E
Squawfish, Colorado	E
Stickleback, unarmored threespine	E
Sucker, Lost River	E
Sucker, Modoc	E
Sucker, razorback	E
Sucker, short-nose	E
Trout, Lahontan cutthroat	T
Trout, Little Kern golden	T
Trout, Paiute cutthroat	T
Crayfish, Shasta (=placid)	E
Shrimp, California freshwater	E
Beetle, delta green ground	T
Beetle, valley elderberry longhorn	T
Butterfly, bay checkerspot	T
Butterfly, El Segundo blue	E
Butterfly, Lange's metalmark	E
Butterfly, lotis blue	E
Butterfly, mission blue	E
Butterfly, Myrtle's silverspot	E
Butterfly, Oregon silverspot	T
Butterfly, Palos Verdes blue	E
Butterfly, San Bruno elfin	E
Butterfly, Smith's blue	E
Moth, Kern primrose sphinx	T
Barberry, Truckee	E
Bird's beak, palmate-bracted	E
Bird's-beak, salt marsh	E
Broom, San Clemente Island	E
Bush-mallow, San Clemente Island	E
Cactus, Bakersfield	E
Centaury, spring-loving	T
Checker-mallow, pedate	E
Coyote-thistle, Loch Lomond	E
Cypress, Santa Cruz	E
Evening-primrose, Antioch Dunes	E
Evening-primrose, Eureka Valley	E
Evening-primrose, San Benito	T
Fiddleneck, large-flowered	E
Gilia, Monterey	E
Goldfields, Burke's	E
Grass, Eureka Dune	E
Grass, Solano	E
Gumplant, Ash Meadows	T
Jewelflower, California	E
Larkspur, San Clemente Island	E
Layia, beach	E
Liveforever, Santa Barbara Island	E
Lupine, clover	E
Mallow, Kern	E
Manzanita, Presidio (=Raven's)	E
Meadowfoam, Butte County	E
Meadowfoam, Sebastopol	E
Mint, San Diego mesa	E
Mustard, slender-petaled	E

California

Species Name	*Status*
Niterwort, Amargosa	E
Paintbrush, San Clemente Island Indian	E
Rock-cress, McDonald's	E
Spineflower, Howell's	E
Spineflower, slender-horned	E
Spineflower, Sonoma	E
Sunshine, Sonoma (Baker's stickyseed)	E
Thornmint, San Mateo	E
Wallflower, Contra Costa	E
Wallflower, Menzies'	E
Woolly-star, Santa Ana River	E
Woolly-star, Hoover's	T
Wooly-threads, San Joaquin	E



Aleutian Canada Goose

(*Branta canadensis leucopareia*)—Threatened

Current Status: Winter habitat of Aleutian Canada geese is primarily under private ownership and thus unprotected. Disease, especially avian cholera, and contaminants threaten the species as it becomes concentrated within limited areas. Some illegal hunting still occurs.

Achievements: Geese that nest in the Semidi Islands, Alaska, have responded slowly but steadily to management (i.e., creating short winter grazing habitat) in California and protection from hunting in California and Oregon. Successful management efforts (e.g., control of arctic fox on breeding islands, transplanting geese to new nesting islands, and hunting closures) throughout the species' range resulted in its reclassification from endangered to threatened status in 1990. The population now numbers approximately 7,900 birds, according to the 1991/1992 winter estimate, exceeding the recovery plan goal for delisting. However, delisting has not occurred because objectives for establishing nesting populations in the Aleutian Islands, Alaska, and protecting wintering habitat have not been met.

Movements and population status of Aleutian Canada geese on their migration and wintering grounds have been monitored for almost two decades. Studies of habitat selection on the migratory and wintering grounds are currently under way. A plan has been formulated under the direction of the Environmental Protection Agency to protect Aleutian Canada geese from exposure to certain pesticides in Merced County, California.

Current Recovery Needs: Conservation of the species' winter habitat is the primary recovery need. Monitoring of population size and movements, determining winter habitat requirements, and investigating competition with other Canada goose subspecies also are needed. In addition, areas with high disease occurrence, such as the Modesto Sewage Treatment Facility ponds, need to be managed to discourage Aleutian Canada goose use. Cooperative agreements between agency staff and private landowners need to be established to address increasing concern over crop depredations.

Partnerships

Department of Agriculture's Animal Damage Control Division: A hazing program was begun in the winter of 1991/1992 to discourage geese from using the Modesto Sewage Treatment Facility ponds. In 1992, only 1 bird died from avian cholera as compared to 52 birds during the previous winter.

California Department of Fish and Game: The Department maintains hunting closures for Aleutian Canada geese and manages the winter habitat on State Wildlife Areas, including portions of the Lake Earl Wildlife Area.

Humboldt State University: Data collected from 1974 to 1989 on Aleutian Canada goose movements and population status were analyzed through a Humboldt State University contract. A final report will be completed in 1993.

Recovery Plan Status: Original plan approved 3/7/79; revised 9/30/91.

FWS File Photo

California

American Peregrine Falcon

(*Falco peregrinus anatum*)—Endangered

Current Status: Continued DDT contamination of avian prey species that winter in Latin America; human use and development of foraging areas, especially wetlands; shooting; human disturbance of nest sites; and collisions with wires, fences, and cars threaten the species. Eggshell thinning remains a problem in much of northern California and remains severe along the California coast.

Achievements: Although the early 1970s saw a reduction of breeding pairs from several hundred to only 5 or 10, the status of this species in California has improved in response to legal protection, restrictions on organochlorine pesticides (e.g., DDT) in the U.S. and Canada, and captive-breeding and release of more than 700 young birds throughout the State. By 1992, the number of known active peregrine sites had increased to 113, and 104 offspring were born in the wild. The Fish and Wildlife Service is considering reclassification of this subspecies from endangered to threatened.

Recent section 7 consultations have involved timber harvest activities conducted by the Forest Service, Bureau of Land Management, and the Hoopa Tribe (through the Bureau of Indian Affairs), as well as consultations on powerline construction and nest ledge enhancement projects. In general, agencies have been quite successful in planning activities to avoid adverse effects, and no jeopardy opinions have been issued.

Craig Koppie

Current Recovery Needs: Evaluation is needed to determine if further manipulation, population monitoring, contaminants studies, and habitat protection should continue, particularly at nest sites and foraging areas. Continued removal of thin-shelled eggs for laboratory incubation from nests with known reproductive impairment also is needed.

Section 6 Funding and Activities: In FY 1992, the California Department of Fish and Game received $10,000 for inventory work.

Partnerships

Bureau of Land Management: Less than one-half of the known peregrine falcon sites in California are on Bureau of Land Management land, but this agency leads in peregrine monitoring statewide and is active on the California Peregrine Falcon Working Team.

Forest Service: The Forest Service has provided funding for the Statewide falcon recovery effort and monitored sites on its land. It also participates actively on the California Peregrine Falcon Working Team.

National Park Service: Numerous peregrine falcon eyries occur in national parks. The Federal agency supports Statewide reintroduction efforts.

California Department of Fish and Game: The Department participates actively on the California Peregrine Falcon Working Team.

The Peregrine Fund: Much of California's recovery effort has been funded by private donations to The Peregrine Fund for captive breeding and reintroduction.

The Nature Conservancy: The Nature Conservancy has helped acquire lands containing peregrine falcon eyries.

Recovery Plan Status: Original plan approved 8/3/77; revised 12/14/84.

California Condor

(*Gymnogyps californianus*)—Endangered

Current Status: The captive breeding program has increased the number of California condors from only 27 in 1987 to 64 in 1992. Continuing threats include loss of habitat, poisoning, and illegal shooting.

Achievements: The improved status of the California condor is primarily the result of the successful captive breeding program. The program developed a multiple clutching technique that involved removing eggs from the nests and incubating them artificially. This stimulated the condors to lay second or even third clutches each breeding season. Additionally, an experimental Andean condor release project was successful in developing release techniques for California condors, as well as training biologists to perform and monitor condor releases. Two California condors bred in captivity were released into the wild in 1992. Section 7 consultations with the Forest Service resulted in the establishment of buffer zones around historic condor nesting and roosting sites, burial of powerlines in condor flight zones, and control on the timing and methods of oil development within critical parts of the condor's range.

Current Recovery Needs: The condor breeding program should be expanded to accommodate the growing captive population. Additional release sites should be established in California, and at least one release site established outside the State. Also, research addressing contaminants in the condor's historical range should be initiated.

Partnerships

Forest Service: A participant on the Condor Recovery Team, this Federal agency has enhanced forest lands for condor recovery through its Los Padres National Forest management plan. The Forest Service has preserved historic roosting, nesting, and foraging habitat, and has provided facilities and equipment to support the condor reintroduction program.

California Department of Fish and Game: Another member of the Condor Recovery Team, this State agency protects condors and their habitat under State authorities and programs.

Carl B. Koford

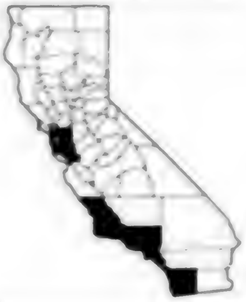
Los Angeles Zoo and San Diego Wild Animal Park: Since 1987, when the last wild condor was captured, propagation flocks at these zoological institutions have produced 37 chicks. In the last 2 years, they produced 22 chicks, 8 of which are eligible for release into the wild. Two were released in 1992, and six more will be released in 1993.

Recovery Plan Status: Original plan approved 4/9/75; revised 7/31/84.

California

California Least Tern

(Sterna antillarum browni)—Endangered



Current Status: Pier and marina construction have reduced the tern's foraging habitat, while predators and human activities have disturbed nesting colonies. Natural events, such as increased ocean temperatures during El Nino conditions, have impacted food supplies.

Achievements: Since this species was listed in 1973, the U.S. population has increased from 625 pairs to 1,800 pairs. Fencing, site monitoring, habitat enhancement and creation, and predator management efforts are believed to be responsible for the significant increase. Recent section 7 activities have included formal and informal consultations with the Navy for San Diego Bay in-water construction activities, a pipeline crossing a tern nesting area at the mouth of the Tijuana Estuary, and the effects of military training on nesting terns at Camp Pendleton Marine Corps Base.

Current Recovery Needs: Population monitoring, predator management, biological research, development of site-specific management plans, site acquisition, and habitat conservation and restoration need to continue.

Section 6 Funding and Activities: The California Department of Fish and Game received $60,000 in FY 1991 and $58,000 in FY 1992 to complete a tern census.

Partnerships

Department of the Navy: In 1987, the Fish and Wildlife Service and the Navy executed a Memorandum of Understanding (MOU) for least tern management at three nesting colonies in San Diego Bay. Actions taken under this MOU have provided one of the most effective management programs for least terns in the San Diego Bay area. The Navy's tern management efforts, under the Landing Craft Air Cushion project mitigation requirements, have contributed significantly to maintaining and enhancing tern reproductive success at Camp Pendleton, which has the largest nesting colony in the State.

U.S. Air Force: In 1992, the Air Force committed itself to long-term management of the three least tern nesting populations at Vandenberg Air Force Base in conjunction with a commercial vehicle launch program. The Fish and Wildlife Service provided technical management assistance.

California Department of Fish and Game: In 1991 and 1992, this State agency conducted censuses and monitoring studies to help assess population status and management needs.

California State University at Long Beach: In 1992, a 3-acre beach site adjacent to Santa Monica Bay was fenced and monitored daily by volunteers from Heal-the-Bay, National Audubon Society, University of California (Los Angeles), and California State University (Long Beach). Funded through a grant from the Environmental Protection Agency, the California State University at Long Beach had oversight of this effort to create a new least tern nesting area.

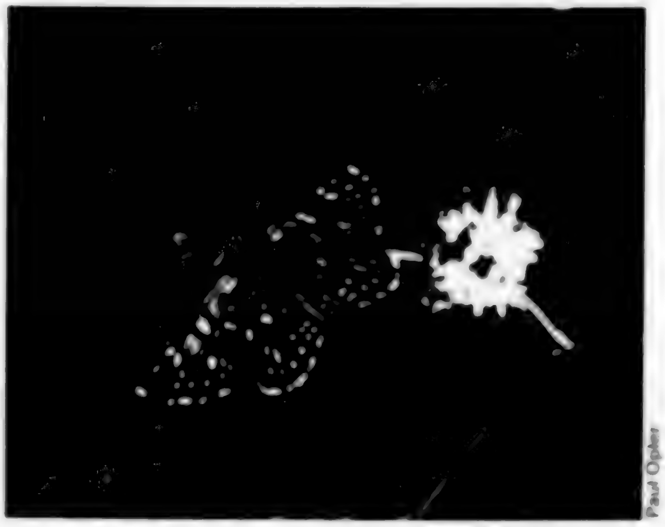
Recovery Plan Status: Original plan approved 4/2/80; revised 9/27/85.

Kenneth W. Fink

California

Lange's Metalmark Butterfly

(*Apodemia mormo langei*)—Endangered



Paul Opler

Current Status: One threat to Lange's metalmark butterfly is invasive exotic vegetation, which eliminates foodplants for butterfly larvae and nectar sources for adults. Uncontrolled fire, which could kill the butterflies or damage their foodplants, is another threat.

Achievements: The single known population of Lange's metalmark butterfly, found at the Antioch Dunes National Wildlife Refuge, has responded favorably to management. The peak population of adult butterflies increased from a low of about 172 individuals in 1986 to about 700 in 1989. Continued habitat restoration by Refuge staff, including the planting of larval foodplants, and termination of an intensive capture-mark-recapture program are responsible for the steady growth in the butterfly's population. (Excessive handling during the capture-mark-recapture program may have resulted in damage or death of individuals.) Equally encouraging is the recent sighting of butterflies in areas of the Refuge where they had not previously been observed.

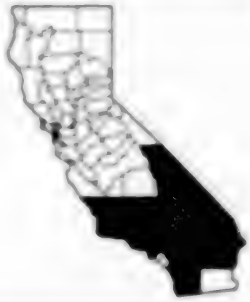
Current Recovery Needs: The species will need continued population monitoring, control of nonnative vegetation, and further research on its biology and ecology. Research will emphasize transect counts and other methods that do not require handling to reduce harm to the butterflies.

Partnerships

Pacific Gas and Electric Company (PG&E): In 1990, PG&E donated 300 cubic yards of sand from a nearby site to the Refuge. The sand was revegetated with larval foodplants and other native species, and several adult butterflies were observed at this site in 1992. PG&E is involved with the Refuge staff in conserving the Lange's metalmark butterfly, as well as other invertebrates that are candidates for listing.

Recovery Plan Status: Original plan approved 3/21/80; revised 4/25/84.

California



Least Bell's Vireo

(*Vireo bellii pusillus*)—Endangered

Current Status: Loss of riparian woodland habitat to urban and agricultural development, livestock grazing, flood control, and water development projects continue to affect least Bell's vireo populations. Nesting parasitism by the brown-headed cowbird also causes problems.

Achievements: Since this species was listed in 1986, the U.S. population has increased from about 300 pairs to 500 pairs. Two populations, one at Santa Margarita River and the other at Prado Basin, now consist of 100 or more pairs, while as recently as 1986, the Prado Basin population contained only 19 pairs. Cowbird trapping, as well as habitat management and enhancement, apparently are responsible. In another hopeful development, vireos have been sighted in areas where they were previously undetected.

Two years of informal section 7 consultations between the Fish and Wildlife Service, Sweetwater Authority, and Army Corps of Engineers have led to a tentative agreement to eliminate an upstream sediment detention basin and sediment transport project from an area containing more than 30 vireo pairs. The Sweetwater Authority has agreed to address the Sweetwater Reservoir's sedimentation problem with a plan to remove surface sediment only below the high water line and only when the vireos are absent. Thirty years of sand extraction operations also have ceased. The disturbed upstream habitat must be revegetated and occupied by vireo pairs before surface sediment removal disturbs an equal amount of downstream habitat. Section 7 consultations with the Federal Highway Administration over various highway projects and bridge construction also are under way.

In addition, in 1991, the Service received two section 10 permit applications and final draft Habitat Conservation Plans from the San Diego Association of Governments for the San Diego and Sweetwater Rivers. The Habitat Conservation Plans are under review, and a draft environmental assessment is being prepared.

Current Recovery Needs: Continued population monitoring, cowbird management, biological research, watershed-specific management plans, and habitat conservation and restoration are needed.

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Section 6 Funding and Activities: The California Department of Fish and Game received $90,000 in FY 1991 and again in FY 1992 for least Bell's vireo management. In FY 1991, $45,000 were used for cowbird control and $45,000 for population surveys. In FY 1992, it was recommended that $60,000 be spent on cowbird control and $30,000 on population surveys.

Partnerships

U.S. Marine Corps: The Fish and Wildlife Service and the Marine Corps signed a 1989 Memorandum of Understanding (MOU) for vireos within proposed critical habitat on Camp Pendleton. Resulting actions have helped control cowbirds, increasing vireos from 15 territories in 1980 to 259 in 1991.

California Department of Fish and Game: The Department assists with cowbird control and vireo monitoring.

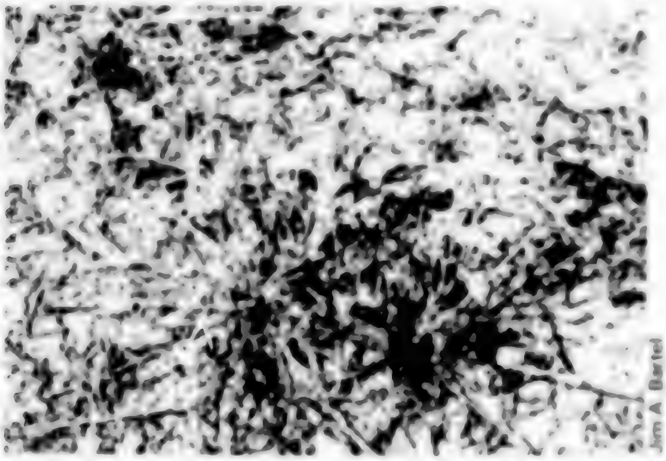
Recovery Plan Status: Agency draft plan.

Loch Lomond Coyote-thistle

(*Eryngium constancei*)—Endangered

Current Status: Despite its common name, this plant is not a thistle but a member of the parsley family. Because it exists at only a single site, the floor of a vernal (temporary springtime) lake, the species is vulnerable to disasters, such as fire and drought, and outbreaks of pests and disease. It is also threatened by off-road vehicle use of the lake bottom during dry seasons and development of the watershed that feeds the lake.

Achievements: The California Department of Fish and Game bought the lake bottom habitat of the Loch Lomond coyote-thistle in 1988 and fenced it in 1989, thus protecting it from illegal dredging and off-road vehicle use. Vandalism to the fence was repaired in 1989 and 1992. An area of the lake damaged earlier was recontoured and seeded in 1985, and now has a plant density comparable to that in the rest of the lake bottom. The Fish and Wildlife Service is currently considering reclassifying this species from endangered to threatened.



Jim A Bartel

Current Recovery Needs: The single site will need continued monitoring to prevent and/or repair damage to the surrounding fence. Additionally, development proposals in the watershed should be reviewed and recommendations made for preventing an increase in the flow of sediment and chemicals into the lake. The California Department of Fish and Game wants to expand the preserve to include the lake's watershed. Population size and health should also be monitored. Investigations into the population biology of the species is needed to allow planning for potential problems.

Partnerships

California Department of Fish and Game: This State agency, which owns the lake habitat of the Loch Lomond coyote-thistle, continues to monitor the status of the fence and make necessary repairs.

Recovery Plan Status: No plan will be prepared. The only known population occurs on land owned and managed by the California Department of Fish and Game.

California

San Clemente Loggerhead Shrike

(*Lanius ludovicianus mearnsi*)—Endangered

Current Status: The San Clemente loggerhead shrike was listed as endangered in 1977 primarily because of extensive habitat loss and degradation from decades of overgrazing by introduced feral goats, pigs, and deer. The deer have been eliminated, and feral goats and pigs are on the verge of eradication. However, predation on shrike eggs, nestlings, and juveniles by a variety of nonnative species, especially feral cats, continues to threaten this species.

Achievements: Although the shrike population remains precipitously low (fewer than 20 pairs), the effort to remove feral animals has resulted in habitat recovery throughout the island. Additionally, birds from a captive breeding program have successfully supplemented the nesting success of this subspecies.

Current Recovery Needs: Recovery of the San Clemente loggerhead shrike will require continued population monitoring, captive propagation and release, additional removal of feral herbivores, predator management, and habitat conservation.

Section 6 Funding and Activities: In FY 1992, the California Department of Fish and Game received $60,000 for captive propagation of the shrike. These funds were authorized for carryover into FY 1993.

Partnerships

Department of the Navy: Since the late 1970s, the Navy has made a concerted effort to eradicate feral herbivores from San Clemente Island. This program has resulted in the elimination of over 30,000 animals.

Department of Agriculture's Animal Damage Control Division: This Federal agency's Animal Damage Control personnel are funded by the Navy to complete the elimination of feral herbivores and to manage feral cats and other predators.

California Department of Fish and Game: This State agency has been involved in facilitating the captive propagation of the San Clemente loggerhead shrike.

University of California at Berkeley: The University's on-going collaboration with the Navy has increased understanding of the shrike's status and ecology and is contributing to the success of the captive propagation and release effort.

Zoological Society of San Diego, Center for the Reproduction of Endangered Species: In collaboration with the Navy, staff from the Center are conducting a captive propagation and release effort initiated in 1991.

Western Foundation of Vertebrate Zoology: This private foundation is collaborating with the Navy to increase understanding of the shrike's status and ecology, and is contributing to the success of the captive propagation and release effort.

Recovery Plan Status: Plan approved 1/26/84.

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California

Southern Sea Otter

(*Enhydra lutris nereis*)—Threatened

Richard Bucich

Current Status: The possibility of oil spills from coastal tanker traffic is a primary threat. Accidental drowning in gill and trammel nets remains a risk only in the Purisima Point area. There is also concern about diseases and contamination.

Achievements: Restrictions on gill and trammel net fishing within the southern sea otter's range have increased its numbers to approximately 2,100. The translocation program also has enhanced the population. The translocated colony at San Nicolas Island is not showing the growth originally anticipated, and numbers appear to be declining still. However, a positive side effect is the establishment of a group of breeding females (primarily translocated to San Nicolas Island) at Purisima Point in Santa Barbara County, which significantly increases the breeding range of the mainland population. Without translocation, female otters likely would not have reoccupied this area for 15 to 20 years.

Current Recovery Needs: Recovery needs include continued population monitoring, research to determine factors influencing the low population growth rate, efforts to increase population size and distribution, and development of controls to minimize oil spill risks.

Partnerships

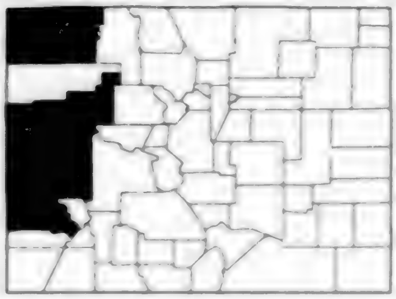
California Department of Fish and Game: In 1987, the Fish and Wildlife Service and the Department signed a cooperative agreement for the translocation of sea otters to San Nicolas Island and the maintenance of an otter-free area (i.e., the containment program). The Department also helps survey the population and assess sea otter mortality.

Recovery Plan Status: Original plan approved 2/3/82; revised 12/26/85.

Colorado

Species Name	*Status*
Ferret, black-footed	E
Crane, whooping	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, least (interior population)	E
Chub, bonytail	E
Chub, humpback	E
Squawfish, Colorado	E
Sucker, razorback	E
Trout, greenback cutthroat	T
Butterfly, Uncompahgre fritillary	E
Skipper, Pawnee montane	T
Beardtongue, Penland	E
Bladderpod, Dudley Bluffs	T
Cactus, Knowlton	E
Cactus, Mesa Verde	T
Cactus, spineless hedgehog	E
Cactus, Uinta Basin hookless	T
Ladies'–tresses, Ute	T
Milk-vetch, Mancos	E
Milk-vetch, Osterhout	E
Phacelia, North Park	E
Twinpod, Dudley Bluffs	T
Wild-buckwheat, clay-loving	E

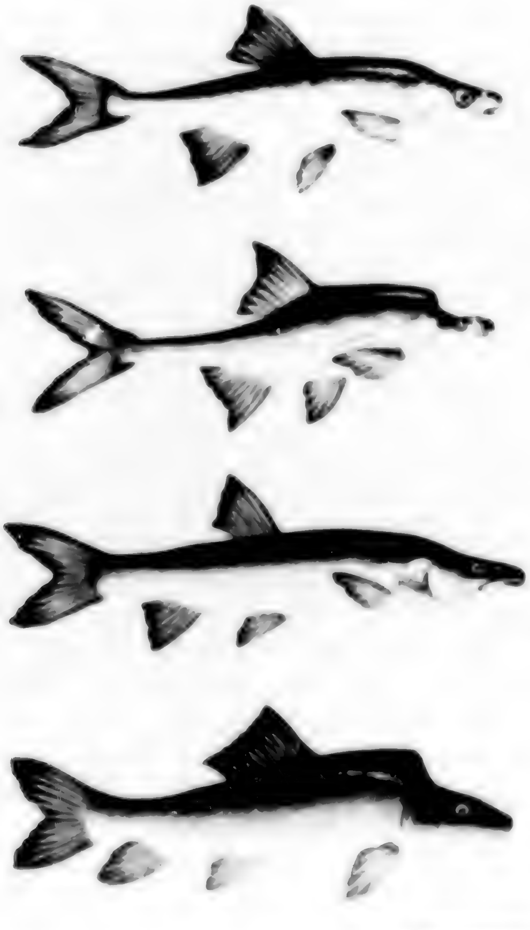
Colorado River Fishes



Species:

Colorado Squawfish (*Ptychocheilus lucius*)—Endangered
Humpback Chub (*Gila cypha*)—Endangered
Bonytail Chub (*Gila elegans*)—Endangered
Razorback Sucker (*Xyrauchen texanus*)—Endangered

Current Status: These endangered Colorado River fishes are threatened by destruction of floodplain habitat, reduction of spring flows, alteration of natural river flows, flow fluctuations for hydropower production, passage barriers, contaminants, cold water temperatures below mainstem reservoirs, and competition with and predation by nonnative fishes.



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From top: bonytail chub, humpback chub, Colorado squawfish, razorback sucker

Achievements: The highest priority for the endangered Colorado River fishes is to prevent their extinction until recovery can be achieved. To meet that priority, an additional refugium has been constructed near Grand Junction, Colorado, with funds from the Bureau of Reclamation, Fish and Wildlife Service, and Colorado Division of Wildlife. This facility has six ponds for holding genetically representative wild stocks of these four endangered fishes, creating a gene bank for future reintroduction and augmentation programs after habitat problems have been solved. A number of programs to determine the best methods for conserving or restoring suitable habitat are under way.

Current Recovery Needs: Habitat restoration will be vital for recovering these endangered fishes. Floodplain habitats will need to be reconnected to mainstem rivers so that they flood seasonally, flows must be managed to mimic historical conditions, fish passage must be restored at some locales, nonnative fishes must be controlled where they impact these native species, contaminants must be reduced, and opportunities for releasing warmer water from reservoirs must be explored. In some areas, captive-bred fishes will have to be reintroduced to evaluate habitat restoration efforts.

Section 6 Funding and Activities: The State of Colorado received $85,987 in FY 1991 and $109,000 in FY 1992 to determine the impact of nonnative, warm-water game fish species on the endangered fishes; develop a strategy for minimizing negative effects of nonnative fishes; and assist in monitoring the Colorado squawfish and humpback chub.

Partnerships

Recovery Implementation Program for the Endangered Fishes in the Upper Colorado River Basin: The goals of this program include recovery of the four fishes in the upper Colorado River basin (excluding the San Juan River basin) while allowing water development to continue. Major elements include determination of habitat needs, restoration of habitat to meet those needs, propagation and genetics management, management of nonnative fishes, research, monitoring of fishes and habitats, and data management.

Participants include four Federal agencies: the Fish and Wildlife Service, Bureau of Reclamation, Western Area Power Administration, and National Park Service. State agencies include the Colorado Department of Natural Resources, Utah Department of Natural Resources, and State of Wyoming. Also involved are various conservation groups and upper basin water users.

San Juan River Seven-Year Research Plan: The purpose of this Plan is to determine the physical, chemical, and biological factors limiting native fish populations in the San Juan River, and to provide management options to restore the endangered fish community. Plan participants include three Federal agencies: the Fish and Wildlife Service, Bureau of Reclamation, and Bureau of Indian Affairs. State participants include the Colorado Division of Wildlife, Utah Division of Wildlife Resources, and New Mexico Game and Fish Department. The Bureau of Reclamation is committed to funding the research, as well as operating Navajo Dam to provide test flows for the research.

San Juan River Basin Recovery Implementation Program: The purpose of this program is to restore endangered fishes in the San Juan River basin while water development proceeds. Federal participants include the Fish and Wildlife Service, Bureau of Reclamation, and Bureau of Indian Affairs. The States of Colorado, Utah, and New Mexico are also involved. Additional participants are the Navajo Nation, Southern Ute Indian Tribe, Ute Mountain Ute Indian Tribe, Jicarilla Apache Indian Tribe, local governments, and non-Federal water development interests. Major elements of the program include genetics management and population augmentation; protection, management, and restoration of habitat; studies of interactions between native and nonnative fish species; monitoring; and data management.

Recovery Plan Status:

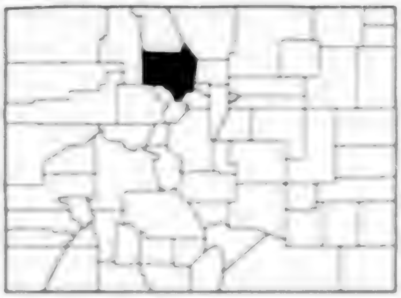
Colorado squawfish—original plan approved 3/16/78; revised 8/6/91.

Humpback chub—original plan approved 8/22/79; revised 9/19/90.

Bonytail chub—original plan approved 5/16/84; revised 9/4/90.

Razorback sucker—plan under development.

Colorado



Osterhout Milk-vetch

(*Astragalus osterhoutii*)—Endangered

Current Status: Threats to the species include habitat alterations resulting from the Muddy Creek Reservoir, off-road vehicle use, water and road development on private land, and changes in habitat management on both public and private land.

Achievements: Habitat purchases, land exchanges, and formal land management designations (e.g., Areas of Critical Environmental Concern) for the species have been initiated by the Bureau of Land Management. Seed collections for storage and for propagation studies have been made, and transplanting, habitat management, and population monitoring studies have been initiated. In addition, for the past 2 years, research has been conducted on the pollination biology of the Osterhout milk-vetch. Informal section 7 consultations with the Colorado Department of Transportation and Colorado River Water Conservation District have ensured that road maintenance and other activities are conducted in ways that minimize disturbance to the species and its habitat.

Current Recovery Needs: Necessary recovery actions for the Osterhout milk-vetch include continued research to determine the best habitat management practices for the species, negotiating with habitat owners and managers to put such practices into place, and continued monitoring of populations to better understand the species' reproductive success and population trends.

Partnerships

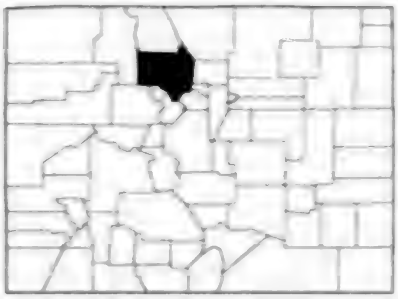
Bureau of Land Management: This Federal agency has developed habitat management plans for populations of the Osterhout milk-vetch under its jurisdiction, and has pursued land purchases and exchanges to protect priority populations on other lands. The Bureau has been involved in inventorying and mapping all known populations of the species on its lands and has served as a local contact and source of expertise for conserving the Osterhout milk-vetch on both private and public land.

The Nature Conservancy: The Conservancy has conducted habitat management and monitoring research, drafted a habitat management plan, and facilitated habitat purchases and exchanges.

Recovery Plan Status: Plan approved 9/30/92.

Jeff Dawson

Colorado



Penland Beardtongue

(*Penstemon penlandii*)—Endangered

Jeff Dawson

Current Status: The Penland beardtongue occurs only on particular types of soils. This plant faces threats from habitat disturbance by off-road vehicle use, excessive trampling by livestock, and surface mining.

Achievements: Habitat purchases, land exchanges, and formal land management designations (e.g., Areas of Critical Environmental Concern) for the species have been initiated by the Bureau of Land Management. Seed collections for storage and for propagation studies have been made, and transplanting studies have been initiated. In addition, for the past 2 years, research has been conducted on the pollination biology of the Penland beardtongue. Informal section 7 consultations with the Colorado Department of Transportation and Colorado River Water Conservation District have ensured that road maintenance and other activities are conducted in ways that minimize disturbance to the species and its habitat.

Current Recovery Needs: Necessary recovery actions for the Penland beardtongue include further research on its pollination and reproductive biology, site inventories, and protection of currently known populations.

Partnerships

Bureau of Land Management: This Federal agency has developed habitat management plans for populations of the species under its jurisdiction, and has pursued land purchases and exchanges to protect high priority populations on other lands. The Bureau has been involved in inventorying and mapping all known populations of the species on its lands and has served as a local contact and source of expertise for conserving the Penland beardtongue on both private and public land.

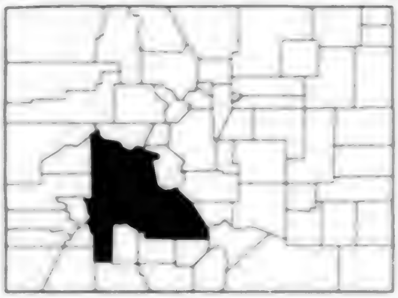
The Nature Conservancy: The Conservancy has conducted habitat management and monitoring research, drafted a habitat management plan, and facilitated habitat purchases and exchanges.

Recovery Plan Status: Plan approved 9/30/92.

Colorado

Uncompahgre Fritillary Butterfly

(*Boloria acrocnema*)—Endangered



Current Status: The greatest threat to the species is from overcollecting. The Uncompahgre fritillary butterfly lives in patches of snow willow at high elevations, and has very limited habitat, a small population size, and low genetic variability, which may affect long-term population stability. The species is susceptible to trampling by recreationists and grazing animals.

Achievements: Population monitoring has been conducted for 5 years (through 1992) at the two known colony sites. Preliminary reports indicate that the 1992 population of the Uncompahgre fritillary butterfly has increased slightly from previous years. Studies to determine climatological effects on the species and its habitat have been conducted, as well as research on reproductive biology, larval development, and host plant-butterfly interactions. Long-term studies to improve management of the butterfly also are under way. In addition, prohibitions on collection of the species are being enforced.

Current Recovery Needs: Necessary recovery actions include restricting collection of the butterfly, monitoring known populations and searching for new ones, and continuing data collection to determine if there are any other threats to the species.

Amy Seidl

Partnerships

Forest Service and Bureau of Land Management: The Forest Service and the Bureau entered into an interagency agreement with the Fish and Wildlife Service in 1992 to conduct long-term studies of the butterfly. The Forest Service and the Bureau have responsibilities to conduct surveys for new colonies, carry out law enforcement activities, continue population monitoring, and, if determined to be necessary, implement reintroduction.

The Colorado Natural Areas Program: The Colorado Natural Areas Program has provided a person to participate on the recovery team for the butterfly.

Recovery Plan Status: Technical draft plan.

Connecticut

Species Name	*Status*
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, roseate	E
Turtle, hawksbill sea (=carey)	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Beetle, northeastern beach tiger	T
Beetle, Puritan tiger	T
Gerardia, sandplain	E
Pogonia, small whorled	E

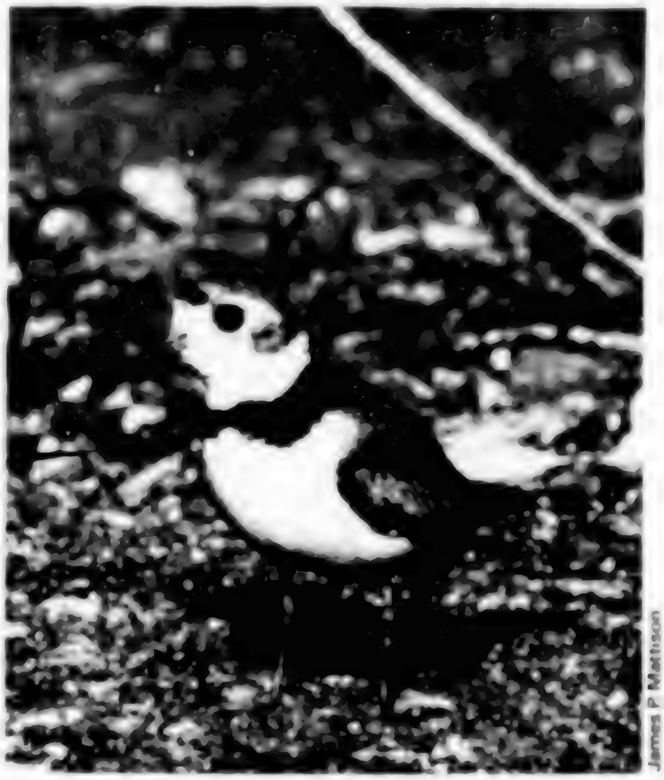
Connecticut

Piping Plover

(*Charadrius melodus*)—Threatened

Current Status: Throughout the piping plover's Atlantic Coast range, persistent threats include loss or alteration of beach nesting habitat from development and coastal stabilization activities, predation, and disturbance by beach recreationists and their pets.

Achievements: The Connecticut piping plover population has doubled from 20 pairs in 1986 to 40 pairs in 1992, and productivity has been consistently high statewide. This population gain resulted primarily from intensive protection efforts, including deployment of predator exclosure devices and implementation of a variety of measures to reduce disturbance from beach activities. Protection of piping plovers from predation and human disturbance has been provided at a number of Connecticut beaches owned by Federal and State agencies, municipalities, private organizations, and individuals. Additionally, an extensive public information program is under way.



James P. Mattison

Current Recovery Needs: Current recovery efforts, including use of predator exclosures and management of nesting habitat, should continue.

Section 6 Funding and Activities: The Connecticut Division of Environmental Protection received $7,000 in both FY 1991 and FY 1992 for piping plover management and protection.

Partnerships

Connecticut Division of Environmental Protection (Wildlife Division): This State agency coordinates a network of cooperators that provide monitoring and protection of all nesting beaches in the State. In 1991, the cooperators spent 2,800 hours in efforts to protect piping plovers in Connecticut.

The Nature Conservancy, Connecticut Audubon Society, and individual volunteers: These cooperators monitor nesting areas, deploy predator exclosures, fence and sign nesting areas, and provide public information on specific beaches.

Recovery Plan Status: Plan approved 3/31/88.

Delaware

Species Name	*Status*
Squirrel, Delmarva Peninsula fox	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Turtle, hawksbill sea (=carey)	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Beaked-rush, Knieskern's	T
Dropwort, Canby's	E
Pink, swamp	T

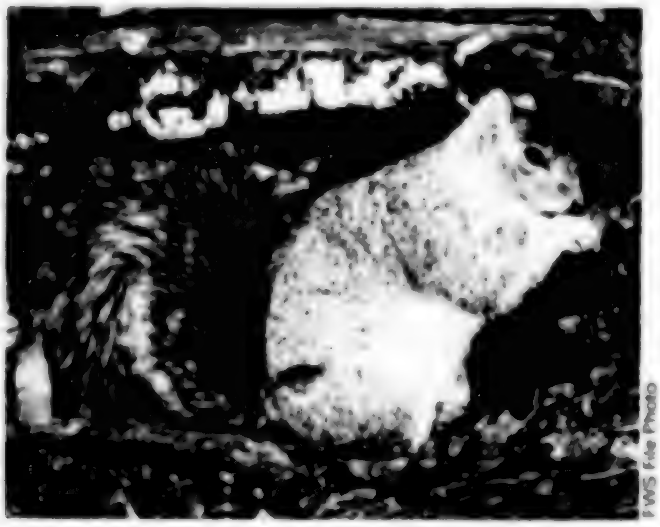
Delaware

Delmarva Peninsula Fox Squirrel

(*Sciurus niger cinereus*)—Endangered

Current Status: Because Delaware populations of the Delmarva Peninsula fox squirrel occur in protected areas, they are not immediately threatened by habitat modification. However, because the populations are so small, the Delmarva fox squirrel is subject to extirpation by natural population fluctuations or other threats, such as disease, predation, or poor mast production, which would constitute less serious threats for larger populations.

Achievements: Delmarva fox squirrels have been translocated to two sites in Delaware: Assawoman State Wildlife Area (1984-1985) and Prime Hook National Wildlife Refuge (1986-1987). Nest box checks in the spring of 1992 revealed a female with a litter of three, as well as two juveniles, at Assawoman; two females with litters of three and four were observed at Prime Hook National Wildlife Refuge. More nest boxes will be placed at both locations.



FWS File Photo

Current Recovery Needs: Although the two populations seem to be faring well, supplementation with additional squirrels may be necessary to ensure sufficient genetic diversity. Several additional suitable sites exist for future translocations in Delaware.

Section 6 Funding and Activities: The Delaware Fish and Wildlife Department was provided $2,000 in both FY 1991 and FY 1992 for monitoring Delmarva fox squirrel populations.

Partnerships

Delaware Fish and Wildlife Department: This State agency has an ongoing monitoring program for the Delmarva fox squirrel.

Recovery Plan Status: Original plan approved 11/6/79; revised 5/9/83.

Delaware

Swamp Pink

(*Helonias bullata*)—Threatened

Current Status: Habitat supporting the swamp pink is threatened by disturbances in adjacent uplands and the upstream watersheds. Such disturbances can degrade water quality, change hydrological conditions, and increase sedimentation in the wetland habitat supporting the swamp pink.

Achievements: Five previously unknown swamp pink occurrences have been located in Delaware through field surveys. Through coordination between the Delaware Department of Natural Resources and Environmental Control and the Department of Transportation, three new highway construction projects were realigned and redesigned to avoid adverse impacts to the species. The State is enforcing existing regulations that provide protection to the species and its habitat.

Current Recovery Needs: Needed recovery actions include protecting habitat to maintain water quality and hydrological conditions, determining and monitoring threats to extant sites, defining essential habitat requirements, completing searches for additional populations, and conducting genetic research.

Section 6 Funding and Activities: The Delaware Department of Natural Resources and Environmental Control was provided $4,100 in FY 1991 and $3,800 in FY 1992 to conduct field surveys for unknown populations and status surveys of known populations.

David Snyder

Partnerships

Delaware Department of Natural Resources and Environmental Control: This State agency is searching for additional populations and protecting the species and its habitat.

The Nature Conservancy: During the past 2 years, this private organization has acquired property that contains a swamp pink population. In conjunction with the Delaware Department of Natural Resources and Environmental Control, the Conservancy also has initiated a project to protect watersheds supporting the swamp pink.

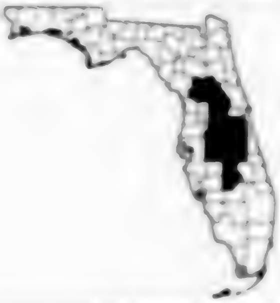
Recovery Plan Status: Plan approved 9/30/91

Florida

Species Name	*Status*
Bat, gray	E
Bat, Indiana	E
Deer, key	E
Manatee, West Indian (=Florida)	E
Mouse, Anastasia Island beach	E
Mouse, Choctawhatchee beach	E
Mouse, Key Largo cotton	E
Mouse, Perdido Key beach	E
Mouse, southeastern beach	T
Panther, Florida	E
Rabbit, Lower Keys	E
Rat, rice (=silver rice)	E
Vole, Florida salt marsh	E
Woodrat, Key Largo	E
Caracara, Audubon's crested	T
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Jay, Florida scrub	T
Kite, Everglade snail	E
Plover, piping	T
Sparrow, Cape Sable seaside	E
Sparrow, Florida grasshopper	E
Stork, wood	E
Tern, roseate	T
Woodpecker, red-cockaded	E
Crocodile, American	E
Skink, blue-tailed mole	T
Skink, sand	T
Snake, Atlantic salt marsh	T
Snake, eastern indigo	T
Turtle, green sea	E
Turtle, hawksbill sea (=carey)	E
Turtle, Kemp's (=Atlantic) ridley sea	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Darter, Okaloosa	E
Sturgeon, Gulf	T
Snail, Stock Island tree	T
Shrimp, Squirrel Chimney (=Florida) Cave	T
Butterfly, Schaus swallowtail	E
Aster, Florida golden	E
Beauty, Harper's	E
Bellflower, Brooksville (=Robins')	E
Birds-in-a-nest, white	T
Blazingstar, scrub	E
Bonamia, Florida	T
Campion, fringed	E
Chaffseed, American	E
Fringe-tree, pygmy	E
Gooseberry, Miccosukee	T
Hypericum, highlands scrub	E
Lead-plant, crenulate	E
Lupine, scrub	E
Meadowrue, Cooley's	E
Milkpea, Small's	E
Mint, Garrett's	E
Mint, Lakela's	E
Mint, longspurred	E
Mint, scrub	E
Mustard, Carter's	E
Pawpaw, beautiful	E
Pawpaw, four-petal	E
Pawpaw, Rugel's	E
Pinkroot, gentian	E
Plum, scrub	E
Polygala, tiny	E
Pondberry	E
Prickly-apple, fragrant	E
Rhododendron, Chapman	E
Skullcap, Florida	T
Snakeroot	E
Spurge, deltoid	E
Spurge, Garber's	T
Spurge, telephus	T
Torreya, Florida	E
Tree-cactus, Key	E
Warea, wide-leaf	E
Water-willow, Cooley's	E
Whitlow-wort, papery	T
Wireweed	E
Ziziphus, Florida	E

Florida

Central Florida Scrub Plants



Species:

Florida Bonamia (*Bonamia grandiflora*)—Threatened
Pygmy Fringe-tree (*Chionanthus pygmaeus*)—Endangered
Garrett's Mint (*Dicerandra christmanii*)—Endangered
Scrub Mint (*Dicerandra frutescens*)—Endangered
Snakeroot (*Eryngium cuneifolium*)—Endangered
Highlands Scrub Hypericum (*Hypericum cumulicola*)—Endangered
Scrub Blazingstar (*Liatris ohlingerae*)—Endangered
Scrub Lupine (*Lupinus aridorum*)—Endangered
Papery Whitlow-wort (*Paronychia chartacea*)—Threatened
Wireweed (*Polygonella basiramia*)—Endangered
Scrub Plum (*Prunus geniculata*)—Endangered
Carter's Mustard (*Warea carteri*)—Endangered
Florida Ziziphus (*Ziziphus celata*)—Endangered

Current Status: Threats to the species continue due primarily to habitat loss from agricultural and residential development.

Achievements: The State's land acquisition programs, accelerated by greatly increased funding through a program known as Preservation 2000, has given high priority to purchasing biological preserves for these species, plus the Florida scrub jay, two threatened lizards, and other narrowly-distributed species of the central Florida scrub. At least two major purchases are anticipated in 1993, and State purchases could total over 20,000 acres. The Fish and Wildlife Service has also proposed establishment of a National Wildlife Refuge on Lake Wales Ridge in the same area, potentially up to 10,000 acres in size. The State and Service proposals overlap. Scrub lupine also is being monitored and protected at a small site.

Current Recovery Needs: Land acquisition remains a primary need. However, as land is purchased, preserve management is becoming increasingly important. The small, isolated populations of scrub lupine also need monitoring.

Section 6 Funding and Activities: The State of Florida is planning to use the $22,500 provided in FY 1992 to set up a monitoring program and develop fire management or other plans.

Partnerships

U.S. Air Force: Incorporating species requirements into its land management policies, the Air Force is collaborating with The Nature Conservancy and Archbold Biological Station in its land management approach on the Avon Park Air Force Range.

Florida Department of Natural Resources: State parks management is being conducted consistent with species requirements and in collaboration with other partners.

Andy Robinson

Scrub Lupine (*Lupinus aridorum*)

Florida Department of Agriculture and Consumer Services, Division of Forestry: With lead responsibility for fire management, the Division of Forestry is carrying out its land managing responsibilities consistent with species requirements and in collaboration with other partners.

Archbold Biological Station: Responsible for research, conservation priorities, and coordination of biological expertise, Archbold Biological Station has developed and disseminated scientific information on the scrub ecosystem and the status of its species.

Bok Tower Gardens: Responsible for a successful garden propagation program (especially for Florida ziziphus), this organization has developed and disseminated scientific information on the scrub ecosystem.

The Nature Conservancy: The Conservancy's State chapter has purchased small tracts of land for its own preserve system and as an intermediary for the State government. It has sponsored a planned Habitat Conservation Plan for the threatened Florida scrub jay, likewise expected to benefit the ecosystem's scrub plants.

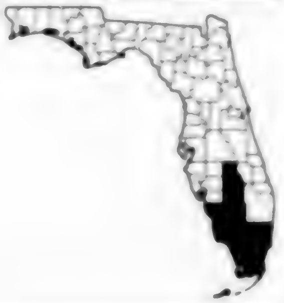
Recovery Plan Status:

Garrett's mint and scrub mint—plan approved 7/1/87.

Remaining 11 plants—plan approved 1/29/90.

Florida Panther

(*Felis concolor coryi*)—Endangered



Current Status: The south Florida counties encompassing the panther's range are among the fastest growing in the nation. Human population growth and agricultural expansion erode panther habitat and reduce numbers. No security against extinction is provided by the single, small, wild population that appears to have stabilized at 30 to 50 adults. Inbreeding and mortality continue to diminish genetic variability and viability.

Achievements: Studies conducted since 1981 have resulted in a draft Florida Panther Habitat Preservation Plan, which may result in significant section 10 activities (e.g., analysis for incidental takings) as public and private landowners realize their respective responsibilities under the Endangered Species Act. The draft habitat preservation plan was developed in response to a habitat preservation task identified in the recovery plan. The draft habitat preservation plan highlights population viability concerns for the Florida panther, addresses the importance of habitat in maintaining a panther population, and identifies occupied and potential panther habitat in south Florida, threats to habitat, and options for maintaining sufficient habitat for a self-sustaining population of panthers in south Florida. In 1991, a captive population was established for genetic management purposes and to provide animals for future release in the wild. Emphasis has also been placed on regulatory measures to reduce human disturbances and actions to improve management practices on public lands.

Significant pressures on existing habitat due to its conversion to citrus/sugarcane production and commercial development have required numerous informal section 7 consultations, as have the releases of environmental contaminants from stationary sources such as garbage incinerators. An informal consultation on the development of a garbage incinerator in Lee County resulted in significant reductions of environmental contaminants through the use of state-of-the-art technology and an aggressive source reduction program. Other achievements include development of 36 wildlife crossings as part of converting State Road 84 to I-75, to be completed in 1993. Expected to reduce panther mortality/injury, the completed crossings already show panther use. With acquisition approximately 83 percent complete, the Florida Panther National Wildlife Refuge is now staffed and operational. Active management, principally the use of controlled burns to improve conditions for panthers and prey resources, is under way.

Work continues toward the development of a captive panther population. Plans call for taking up to six kittens per year over the next 3 to 6 years from selected adults in the wild to achieve the desired genetic representation. Three kittens of each sex were brought into captivity in 1991. In 1992, two kittens of each sex were added. Actions to identify and evaluate potential reestablishment sites in Florida were initiated in 1987, and rangewide in 1991. Present plans include using western cougars (males will be neutered) as surrogates to test the suitability of higher ranked sites.

Current Recovery Needs: Habitat conservation, genetic preservation and management, and population expansion are primary needs. The draft habitat preservation plan must be completed and rapidly implemented. Establishing the captive population also needs to continue as planned. Identification, evaluation, and selection of reestablishment sites must be accelerated.

Section 6 Funding and Activities: The Florida Game and Fresh Water Fish Commission was provided $231,300 in FY 1991 and $215,735 in FY 1992 to conduct a biomedics study, determine the response of the wild panther population to removal of kittens for a captive breeding program, determine prey characteristics, study panther distribution and habitat conservation, conduct captive breeding and reintroduction, and prepare a Florida panther technical bulletin.

Partnerships

National Park Service: Investigative studies undertaken by this Federal agency have provided valuable information for developing management strategies on its lands. An active partner on the Florida Panther Interagency Committee, the National Park Service has monitored the panther and its prey resources at the Everglades National Park and Big Cypress National Preserve, and made sure the species' needs were considered as habitat management and visitor-use decisions were made.

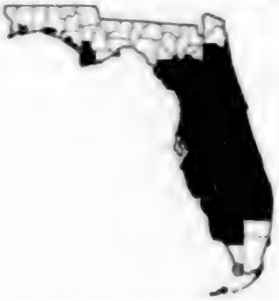
Florida Game and Fresh Water Fish Commission: Another Florida Panther Interagency Committee partner, the Commission started its panther investigations in 1981. Most of its projects have been funded with section 6 grants. Commission initiatives have helped make possible the present understanding of the panther's status

Florida Department of Natural Resources: The Department continues its role as an active member of the Interagency Committee.

Zoological Institutions (White Oak Plantation, Jacksonville Zoological Park, Lowry Park Zoo, and Miami Metrozoo): These organizations are providing facilities and resources to establish a captive Florida panther population. Panthers are being maintained at all institutions except the Miami Metrozoo.

Recovery Plan Status: Original plan approved 12/17/81; revised 6/22/87.

FWS File Photo



Florida Scrub Jay

(*Aphelocoma coerulescens coerulescens*)—Threatened

Current Status: This species is threatened by conversion of its habitat to agricultural, residential, and commercial land uses, and by suppression of fire, which is needed to maintain scrub vegetation.

Achievements: In June 1991, the Fish and Wildlife Service began a statewide initiative to protect remaining scrub jay habitat, including habitat on private lands. Brevard County is preparing a long-term countywide Habitat Conservation Plan. Such Habitat Conservation Plans could allow development in conjunction with habitat protection. Additional funding received in FY 1992 covers many of the initial expenses required for this Habitat Conservation Plan and facilitates needed studies. Indian River, Seminole, and Charlotte Counties have also expressed interest in developing Habitat Conservation Plans. With the cooperation of all leading scrub jay researchers, it is expected that publication of a statewide framework for composition of Habitat Conservation Plans will be completed before the end of 1993. The Service has contracted with Archbold Biological Station to map and survey all remaining scrub within Polk and Highlands Counties and collect data on the birds' tolerance of encroachment into their territories. The Service has also proposed establishment of a National Wildlife Refuge on Lake Wales Ridge, which contains the third largest population of scrub jays in the State. Numerous section 7 consultations with a variety of Federal agencies (e.g., Forest Service, Air Force, National Aeronautic and Space Administration) have resulted in measures that help conserve scrub jay habitat.

Current Recovery Needs: A statewide approach to writing Habitat Conservation Plans is needed so that regional considerations are given to individual and countywide requests for incidental take. Population monitoring and habitat protection, maintenance, and restoration are essential for recovery.

Partnerships

U.S. Air Force, Forest Service, and National Aeronautics and Space Administration (NASA): These Federal agencies develop management plans for scrub jays on public lands, conduct habitat surveys, manage habitats, and develop management guidelines. NASA has banded nearly all scrub jays on Kennedy Space Center property, and research activities are being conducted on the basic biology of the species.

Florida Game and Fresh Water Fish Commission: In April 1991, the agency published "Ecology and Development-Related Habitat Requirements of the Florida Scrub Jay (*Aphelocoma coerulescens coerulescens*)," which encourages private landowners to include scrub jays in their development and management plans by identifying habitat requirements for the species and appropriate land management techniques to ensure the survival of the species in a developed landscape.

Recovery Plan Status: Plan approved 5/9/90.

Florida Audubon Society

Florida

Florida Sea Turtles

Species:
Green Sea Turtle (*Chelonia mydas*)—Endangered
Loggerhead Sea Turtle (*Caretta caretta*)—Threatened

Current Status: Both the green and loggerhead sea turtles are threatened by development of nesting beaches and incidental capture by commercial fishing industries. The green sea turtle is also threatened by disease (large and numerous external and internal fibroid tumors). The cause of these tumors is unknown. High incidence rates of tumors (20 percent of turtles examined) have been noted in both Florida and Hawaiian waters. A lesser incidence has been reported from Australian waters.

Achievements: The Archie Carr National Wildlife Refuge was established in October 1990. As of July 1992, about 40 percent of the proposed refuge lands had been acquired or reserved. Florida has strengthened State regulations that limit structures designed to prevent beach erosion (beach armoring, which may hinder sea turtle nesting) and lights used at night near beaches (lights cause both adult and newly hatched sea turtles to get lost). The Florida Department of Natural Resources has conducted workshops for private, State, and Federal personnel to teach them how to assess sea turtle nesting success. The trained personnel assess the numbers and success of sea turtles nesting on Florida beaches.

Current Recovery Needs: The Archie Carr National Wildlife Refuge needs to be fully acquired. Protection of nesting beaches and nests on beaches needs to be continued. Measures to protect sea turtles from incidental capture in commercial fisheries need to be implemented and enforced. The cause of the tumor disease needs to be determined.

Section 6 Funding and Activities: In FY 1991, the Florida Department of Natural Resources received $45,000 for green and loggerhead sea turtle nest monitoring in Brevard County, Florida. In FY 1992, the agency received $30,865 for evaluating beach lighting ordinances.

FWS File Photo

Green Sea Turtle

C. Kenneth Dodd, Jr.

Loggerhead Sea Turtle

Partnerships

National Marine Fisheries Service: This Federal agency is responsible for implementing the Endangered Species Act to protect sea turtles while they are in their marine habitat.

Florida Department of Natural Resources: This State agency implements regulations designed to protect sea turtles on the beach and in the water, conducts research on various aspects of sea turtle ecology, and oversees research conducted by other agencies or individuals.

Center for Marine Conservation and Caribbean Conservation Corporation: These private organizations help find funding for the Archie Carr National Wildlife Refuge, critique measures proposed to protect sea turtles, and seek public support for regulations designed to protect sea turtles.

Recovery Plan Status:

Green sea turtle—original plan approved 9/19/84; revised 11/29/91.

Loggerhead sea turtle—original plan approved 9/19/84; revised 12/26/91.

Harper's Beauty

(*Harperocallis flava*)—Endangered

Current Status: A perennial, yellow-flowered lily found in the Florida panhandle, Harper's beauty has been overcollected. Also, its numbers have suffered from human and animal trampling, off-road vehicle use, utility corridor and highway maintenance, and encroachment by other vegetation.

Achievements: This lily's entire range is within Apalachicola National Forest, mostly in areas under Forest Service management but also on a few private inholdings. The species continues to spread along a highway right-of-way passing through the Forest, possibly as a result of mowing schedules that allow Harper's beauty seed formation and dispersal while controlling the encroachment of competing plants.

Current Recovery Needs: The recovery plan for Harper's beauty needs to be revised to incorporate 10 years of work on this species, much of it the result of Forest Service efforts to monitor the highway population and conduct searches elsewhere. The Forest Service draft management plan for the species identifies needs to monitor known populations, find additional populations, restore bog habitat through prescribed burning, ensure compatible roadside mowing methods, avoid timber harvest or stumping in bog habitats (stumping is the excavation of pine stumps from which turpentine products are distilled), prevent damage by off-road vehicles, and encourage the conservation of genetic diversity.

Partnerships

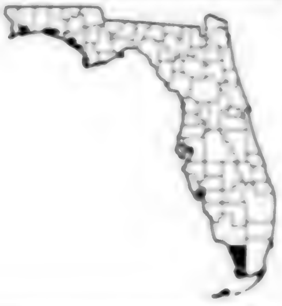
Forest Service: This Federal agency's new draft management guide renders the existing recovery plan (1983) incomplete if not obsolete. Recent reevaluations of prescribed burn practices may benefit this and other fire-dependent species. The Forest Service in Florida has increased its attention to conservation of the native flora, including Harper's beauty, in the past several years.

Cliff Lewis

Florida Department of Transportation: The Department mows the State highway only at the time Harper's beauty is preparing to seed. Botanists attribute the lily's advance to this practice. However, to prevent encroachment of blackberries, this mowing regime may need to be modified.

Volunteers: Private citizens have volunteered time to help the Forest Service hand-cut encroaching shrubs from a Harper's beauty bog site, search for new populations, and assist with monitoring. Volunteers have provided continuity to species monitoring when Forest Service personnel have transferred to other assignments.

Recovery Plan Status: Plan approved 9/14/83.



Key Tree-cactus

(*Cereus robinii*)—Endangered

Current Status: Some visitors to the National Key Deer Refuge illegally remove cactus fragments for rooting. The small size of U.S. Key tree-cactus populations make the Endangered Species Act sanctions essential to discourage such activities.

Achievements: An inventory of tree-cactus populations by a Florida Atlantic University team indicates the number to be almost 500 clumps, more than 10 times greater than previous estimates. Located in dense tropical hardwood thickets, primarily in National Key Deer Refuge, populations are being mapped and counted to provide baseline data for future assessments of the species' status. An evaluation of the cactus' reproductive biology is under way to discover pollinators and determine the mode of seed dispersal. In addition, the Service has acquired some additional habitat for this species.

E. La Verne Smith

Current Recovery Needs: The species' recovery plan has been rendered obsolete by the recent inventory and will be revised. Additional effort needs to be made to protect the tree-cactus on public land and prevent extinction of the moths believed to pollinate the cactus.

Partnerships

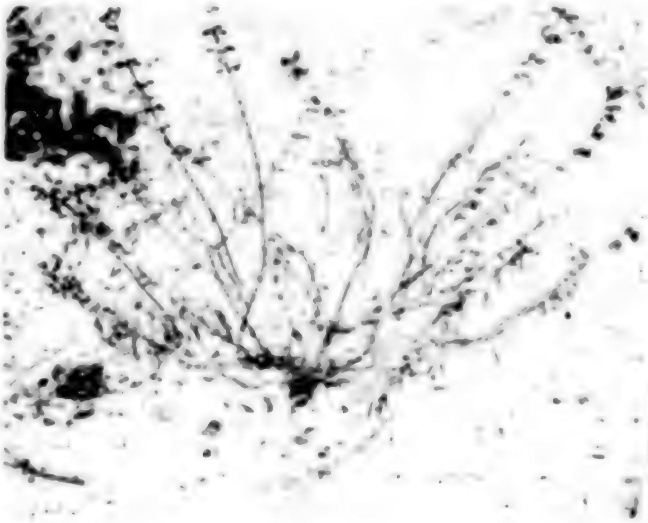
Florida Department of Natural Resources: Responsible for protecting Key tree-cactus in a State recreation area, the Department is in the process of inventorying that population. Recurrent proposals to use the area for a landfill seem to have subsided.

Recovery Plan Status: Plan approved 9/9/86.

Florida

Lakela's Mint

(Dicerandra immaculata)—Endangered



Andy Robinson

Current Status: Except for a newly-established population at Hobe Sound National Wildlife Refuge, this species occurs only on small parcels of private land in a suburban setting. Plants at a private research organization and on a nearby golf course will likely be conserved; all other sites apart from the Hobe Sound Refuge will probably be lost to real estate development.

Achievements: During construction of a road, a private research organization took cuttings of plants at the construction site and replanted them at Hobe Sound National Wildlife Refuge, thus establishing a new population there. Results from the first year are encouraging.

Current Recovery Needs: The recently established population at Hobe Sound National Wildlife Refuge will need continued monitoring, as will the population at the private research organization. Also needed is a plan to encourage conservation and introduction of the plant at protected sites in or near the plant's native range.

Partnerships

Bok Tower Gardens and Center for Plant Conservation: These private organizations have carried out a program to propagate plants for restoration of a disturbed population and have established a new population at the Hobe Sound National Wildlife Refuge.

Recovery Plan Status: Plan approved 7/1/87.

Florida

Pine Rocklands Plants

Species:
Crenulate Lead-plant (*Amorpha crenulata*)—Endangered
Tiny Polygala (*Polygala smallii*)—Endangered
Garber's Spurge (*Chamaesyce garberi*)—Threatened
Deltoid Spurge (*Chamaesyce deltoidea* ssp. *deltoidea*)—Endangered
Small's Milkpea (*Galactia smallii*)—Endangered

Current Status: Outside of Everglades National Park, 98 percent of the distinctive Dade County "pine rocklands" have been destroyed for residential and agricultural purposes. Most remaining pineland vegetation exists in urban areas, where prescribed fire (essential to the life cycle of these plants) causes smoke problems, and high property values make land acquisition prohibitive. Exotic pest plants, notably Burma reed, remain a serious, though manageable, problem. On a positive note, Hurricane Andrew may have benefitted rock pinelands by flattening tropical and exotic pest hardwood species, preparing the way for prescribed fires. Nevertheless, one of only two crenulate lead-plant sites was buried by debris-disposal after the hurricane, and 30 acres of pinelands were destroyed by disposal of hurricane debris.

Debra J Duval

Tiny Polygala (*Polygala smallii*)

Achievements: In a May 1990 referendum, Dade County voters approved a tax increase to raise $90 million for environmentally endangered lands, including pinelands. Collaboration between the State and County to purchase the best remaining rock pinelands in private ownership resulted in acquisition of 30 acres, with 260 remaining. A County pilot project integrating exotic plant control with prescribed fire indicated habitat restoration to be less costly than the cost of controlling wildfires in Burma reed thickets. Assisted by $40,000 in recovery funds, the County also is restoring an existing lawn area to pine rockland at a site where crenulate lead-plant can expand to occupy the habitat. An additional $50,000 is expected to continue the work and provide a comprehensive management plan for the most important remaining pine rocklands at Richmond Heights (near the MetroZoo). Pineland protection efforts will be revised in the wake of Hurricane Andrew, and emergency funds are available for accelerated control of exotic pest plants and prescribed burning. In addition, section 7 consultation took into consideration expansion of the Perrine U.S. Army Reserve Center.

Current Recovery Needs: Land acquisition, exotic pest plant control, prescribed burning, species monitoring, and prevention of human encroachment are the primary needs.

Partnerships

U.S. Government Agencies With Pinelands Plants: The Department of the Army (Reserves and a communications facility), Naval Observatory, Coast Guard, Customs, Department of Justice, Bureau of Prisons, Department of Agriculture, Agricultural Research Service, Federal Aviation Administration, National Institutes of Health (in cooperation with the University of Miami), and General Services Administration consult with the Fish and Wildlife Service if facility expansions are planned. The General Services Administration's tract is undeveloped.

Metropolitan Dade County: The County is working with the Fish and Wildlife Service to develop coordinated management plans for the Federal agencies protecting pineland sites. Nearly all agencies participated in preliminary meetings on vegetation management, and most apply Dade County's technical advice. Hurricane Andrew seriously affected all the agencies and will delay pineland conservation. As of September 1, 1992, the Army Corps of Engineers and Metropolitan Dade County were cooperating to prevent dumping of hurricane debris on these sites.

Florida Department of Natural Resources, Conservation and Recreation Lands Program, and Florida Department of Agriculture and Consumer Services, Division of Forestry: Land purchases have begun in cooperation with Dade County. Fire management services are available, with small prescribed fires being conducted.

Fairchild Tropical Garden: This non-profit organization affiliated with Dade County carries out germplasm conservation of tropical Florida plants and provides technical expertise for County properties. It maintains a garden population of crenulate lead-plant to support reintroduction and to guard against extinction due to inadvertent destruction of wild populations. These garden plants survived the hurricane, although the facility they occupied was largely wrecked.

Recovery Plan Status: Plan approved 10/7/88.

Florida

West Indian Manatee

(*Trichechus manatus*)—Endangered

Current Status: Boat-related mortalities and human impacts on the habitat are the two most important threats to the survival of the manatee. Both may be controlled through conservation efforts. A large number of perinatal deaths have been observed in recent years, but the extent of this problem, if a problem exists, is unknown.

Achievements: The State now requires County Comprehensive Plans in 13 key Florida counties to include Manatee Protection Plans for reducing injuries and mortalities from boats, and plans for locating marinas in ways that reduce impacts on manatee habitat. Radio- and satellite-tracking continue to provide information on migration routes and essential manatee habitat. Research continues on food habits, energetics, population parameters, age-specific survival, and reproductive rates. Manatee sanctuaries at the Crystal River and Merritt Island National Wildlife Refuges have been expanded. Rescue and rehabilitation of sick, injured, and orphaned manatees continues. Section 7 consultations with the Army Corps of Engineers, Coast Guard, and Department of the Navy on a very large number of projects have been completed. Public education on the plight of the manatee has increased.

Current Recovery Needs: Law enforcement needs are growing as boat speed regulations are implemented, and explaining the seriousness of this issue to the judiciary will become increasingly important. Additional research will be needed on captive manatees to improve manatee rehabilitation techniques. A plan is needed to facilitate capture and care of injured or sick manatees in the event of a catastrophic episode of extremely cold weather or outbreak of red tide. A "soft-release" area within habitat on the Kennedy Space Center is needed to allow long-held manatees to adjust to the wild before release.

FWS File Photo

Section 6 Funding and Activities: The Florida Department of Natural Resources received $105,000 in FY 1991 and $70,000 in FY 1992 for use in constructing a modern necropsy facility on the campus of Eckerd College in St. Petersburg.

Partnerships

Army Corps of Engineers: The Corps has worked to minimize the impacts to manatees and their habitat from urban development, dredging and filling, and other development projects, and to eliminate deaths caused by water control and navigation locks. The Corps has also taken measures to eliminate structure-related mortality.

Florida Department of Natural Resources: This State agency has taken the lead in a salvage and necropsy program, minimizing vessel- and structure-related mortalities, developing comprehensive protection plans at the local government level, and mapping important manatee habitats and migration routes. The State has required the 13 counties experiencing the highest vessel-related mortality rates to develop site specific speed zones and comprehensive manatee protection plans.

Save the Manatee Club: This non-profit organization has taken the lead in expanding education and information activities and improving public awareness. The club has trained its members to present manatee education programs to schools and civic groups, and has developed travel displays for programs, schools, and festivals. Money from membership dues and State funding has supported several research projects and purchased equipment and supplies for other agencies and groups.

Recovery Plan Status: Original plan approved 4/15/80; revised 7/24/89.

Florida

Whooping Crane*

(*Grus americana*)—Endangered

*Extirpated from the wild in Florida.

Current Status: The principal threat to whooping cranes in the wild continues to be the potential of a hurricane or contaminant spill destroying their wintering habitat on the Texas coast. Principal threats to captive birds are disease and parasites.

Achievements: The whooping crane has responded favorably to management in several locations throughout its range. Its population continues to increase and is now estimated at 237 birds, including 93 in captivity. This success is due, in part, to increased production of young birds at the Fish and Wildlife Service's Patuxent Wildlife Research Center (Patuxent) in Laurel, Maryland. Patuxent currently has a whooping crane population of 49, including 13 young. Captive production in 1992 was approximately double that of 1991, and included five captive-produced birds resulting from natural breeding. Seven chicks were raised at Patuxent from eggs removed from wild nests in Canada.

The Fish and Wildlife Service has proposed to reintroduce the whooping crane in Florida in 1993 as part of a program to establish a nonmigratory population in the southeast. Cranes are being reared in captive facilities at Patuxent and the International Crane Foundation in Baraboo, Wisconsin, and conditioned for release to the wild. Additionally, young birds have been sent to the Calgary Zoo to stock the Canadian Wildlife Service's new captive whooping crane facility.

Current Recovery Needs: The reintroduction in Florida is likely to require a decade of annual releases to achieve success. The recovery plan calls for two wild, self-sustaining populations in addition to the population that migrates between Texas and Canada. Also, continued research is needed to improve egg fertility and reduce egg breakage.

Partnerships

Florida Game and Fresh Water Fish Commission: A Memorandum of Understanding between this State agency and the Federal government is near completion. Under that agreement, the agency will care for birds being held in temporary enclosures and monitor the birds after their release. Two full-time personnel have been trained to conduct most of the field studies, and a management plan has been written.

Canadian Wildlife Service: This Canadian agency protects nesting habitat of the wild Texas/Canada whooping crane population and works with the Fish and Wildlife Service to collect eggs.

International Crane Foundation: This private foundation now houses approximately 37 cranes, including 12 chicks reared in 1992. Three of the six captive-produced chicks resulted from natural breeding, noteworthy because the first such breeding occurred in 1991.

Recovery Plan Status: Original plan approved 4/12/85; revised 12/23/86.

W.F. Kubichek

Georgia

Species Name	*Status*
Bat, gray	E
Bat, Indiana	E
Manatee, West Indian (=Florida)	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Stork, wood	E
Woodpecker, red-cockaded	E
Snake, eastern indigo	T
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, Kemp's (=Atlantic) ridley sea	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Darter, amber	E
Darter, goldline	T
Darter, snail	T
Logperch, Conasauga	E
Shiner, blue	T
Sturgeon, Gulf	T
Amphianthus, little	T
Buttons, Mohr's Barbara's	E
Campion, fringed	E
Chaffseed, American	E
Dropwort, Canby's	E
Grass, Tennessee yellow-eyed	E
Harperella	E
Pink, swamp	T
Pitcher-plant, green	E
Pondberry	E
Quillwort, black spored	E
Quillwort, mat-forming	E
Rattleweed, hairy	E
Skullcap, large-flowered	E
Spiraea, Virginia	T
Sumac, Michaux's	E
Trillium, persistent	E
Trillium, relict	E
Torreya, Florida	E

Florida Torreya

(*Torreya taxifolia*)—Endangered

Current Status: Wild populations continue to succumb to "fungal blight," for which there is no known remedy. Habitat management can do little to minimize the disease, but germplasm is being conserved through propagation of cuttings.

Achievements: A study of on-site preservation of Florida torreya by The Nature Conservancy, now largely completed, has greatly improved census information on wild populations. Cuttings from the trees are propagated, and sets are provided to widely dispersed botanical gardens in Florida and Georgia for further propagation.

Current Recovery Needs: Continued inventories of wild populations are needed, along with establishment of garden collections of torreya germplasm. It is hoped that planned restoration of the original fire regime in longleaf pinelands adjacent to torreya habitat may have a modest smoke fumigation effect, reducing fungus infections.

Section 6 Funding and Activities: The State of Georgia received $1,000 in FY 1991 and, through the Georgia Freshwater Wetlands and Heritage Inventory, conducted an inventory of the 25 remaining stems in the wild in Georgia and provided financial support for propagation of the species at the Atlanta Botanical Garden.

E. La Verne Smith

Partnerships

Army Corps of Engineers: The Corps owns a small but important area of torreya habitat that it is managing well.

Atlanta Botanical Garden: This non-profit enterprise currently is propagating torreya trees in a greenhouse. The trees will be planted outdoors when they are larger and are showing vertical shoot growth.

Recovery Plan Status: Plan approved 9/9/86.

Hawaii

Species Name	*Status*
Bat, Hawaiian hoary	E
‘Akepa, Hawaii (honeycreeper)	E
‘Akepa, Maui (honeycreeper)	E
‘Akialoa, Kauai (honeycreeper)	E
‘Akiapola‘au (honeycreeper)	E
Coot, Hawaiian (‘alae-ke‘oke‘o)	E
Creeper, Hawaii	E
Creeper, Molokai (kakawahie)	E
Creeper, Oahu (alauwahio)	E
Crow, Hawaiian (‘alala)	E
Duck, Hawaiian (koloa)	E
Duck, Laysan	E
Finch, Laysan (honeycreeper)	E
Finch, Nihoa (honeycreeper)	E
Goose, Hawaiian (nene)	E
Hawk, Hawaiian (io)	E
Honeycreeper, crested (‘akohekohe)	E
Millerbird, Nihoa (old world warbler)	E
Moorhen (=gallinule), Hawaiian common	E
Nukupu‘u (honeycreeper)	E
‘O‘o, Kauai (‘o‘o ‘a‘a) (honeyeater)	E
O‘u (honeycreeper)	E
Palila (honeycreeper)	E
Parrotbill, Maui (honeycreeper)	E
Petrel, Hawaiian dark-rumped	E
Po‘ouli (honeycreeper)	E
Shearwater, Newell's Townsend's (‘a‘o)	T
Stilt, Hawaiian (ae‘o)	E
Thrush, large Kauai	E
Thrush, Molokai (oloma‘o)	E
Thrush, small Kauai (puaiohi)	E
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Turtle, olive (=Pacific) ridley sea	T
Snails, Oahu tree (19 spp.)	E
Abutilon eremitopetalum (=Sci. name)	E
Abutilon sandwicense (=Sci. name)	E
Achyranthes splendens var. rotundata (=Sci. name)	E
‘Akoko (Chamaesyce celastroides var. kaenana)	E
‘Akoko (Chamaesyce kuwaleana)	E
‘Akoko, Ewa Plains	E
Alani	E
Alsinidendron obovatum (=Sci. name)	E
Alsinidendron trinerve (=Sci. name)	E
Aupaka	E
‘Awiwi	E
Bidens, cuneate	E
Bluegrass, Hawaiian	E
Chamaesyce halemanui (=Sci. name)	E
Cyanea macrostegia ssp. gibsonii (=Sci. name)	E
Cyanea superba (=Sci. name)	E
Cyanea undulata (=Sci. name)	E
Diellia falcata (=Sci. name)	E
Dubautia latifolia (=Sci. name)	E
Dubautia pauciflorula (=Sci. name)	E
Gahnia lanaiensis (=Sci. name)	E
Gardenia, Hawaiian (na‘u)	E
Geranium, Hawaiian red-flowered	E
Gouania hillebrandii (=Sci. name)	E
Gouania meyenii (=Sci. name)	E
Haha (Cyanea lobata)	E
Haha (Cyanea mceldowneyi)	E
Haha (Cyanea pinnatifida)	E
Ha‘iwale	E
Haplostachys haplostachya var. angustifolia	E
Hedyotis degeneri (=Sci. name)	E
Hedyotis, Na Pali beach	E
Hedyotis parvula (=Sci. name)	E
Hesperomannia arbuscula (=Sci. name)	E
Hesperomannia lydgatei (=Sci. name)	E
‘Ihi‘ihi	E
Iliau, dwarf	E
Kamakahala	E
Kauai hau kuahiwi	E
Kio‘ele	E
Koki‘o, Cooke's	E
Koki‘o (hau-hele‘ula or Hawaii tree cotton)	E
Ko‘oko‘olau	E
Ko‘oloa‘ula	E
Kulu‘i	E
Liliwai	E
Lipochaeta venosa (=Sci. name)	E
Lobelia niihauensis (=Sci. name)	E
Lysimachia lydgatei (=Sci. name)	E
Mahoe	E
Ma‘oli‘oli	E
Na‘ena‘e	E
Naupaka, dwarf	E
Nehe (Lipochaeta kamolensis)	E
Nehe (Lipochaeta lobata var. leptophylla)	E
Nehe (Lipochaeta tenuifolia)	E

Hawaii

Species Name	*Status*
Neraudia angulata (=Sci. name)	E
Nohoanu	E
‘Oha wai	E
Opuhe	E
Pamakani	E
Panicgrass, Carter's	E
Phyllostegia glabra var. lanaiensis (=Sci. name)	E
Phyllostegia mollis (=Sci. name)	E
Poa siphonoglossa (=Sci. name)	E
Remya kauaiensis (=Sci. name)	E
Remya, Maui	E
Remya montgomeryi (=Sci. name)	E
Sandalwood, Lanai (‘iliahi)	E
Sanicula mariversa (=Sci. name)	E
Schiedea, Diamond Head	E
Schiedea haleakalensis (=Sci. name)	E
Schiedea kaalae (=Sci. name)	E
Silene perlmanii (=Sci. name)	E
Silversword, Haleakala (‘ahinahina)	T
Silversword, Mauna Kea (‘ahinahina)	E
Stenogyne angustifolia var. angustifolia (=Sci. name)	E
Stenogyne campanulata (=Sci. name)	E
Stenogyne kanehoana (=Sci. name)	E
Tetramolopium filiforme (=Sci. name)	E
Tetramolopium lepitodum spp. lepitodum (=Sci. name)	E
Tetramolopium remyi (=Sci. name)	E
Uhiuhi	E
Vetch, Hawaiian	E
Viola helenae (=Sci. name)	E
Viola lanaiensis (=Sci. name)	E
Wawa‘iole	E
Xylosma crenatum (=Sci. name)	E

Hawaii

Hawaiian Crow

(*Corvus hawaiiensis*)—Endangered

Current Status: The current population of the Hawaiian crow, also known as the 'alala, numbers only 13 in the wild and 11 in captivity. The wild birds occupy habitat on private ranchland on the island of Hawaii; the captive birds are held at the Hawaii Division of Forestry and Wildlife's Olinda Endangered Species Propagation Facility on the island of Maui. Introduced mammalian species (e.g., rats, mongooses, and feral cats) prey on crow eggs and young, and non-native ungulates (e.g., pigs and cattle) degrade the crow's habitat. Introduced diseases, inbreeding, natural catastrophes, and habitat changes due to introduced plants constitute other potential threats to this extremely small population.

Achievements: The private ranchland where the wild population exists was inaccessible to Fish and Wildlife Service biologists until 1992 when the Service was permitted to begin an intensive field study of the species. Research and recovery efforts resulted in documentation of factors limiting the species' survival. Also in 1992, the Service established a 5-year plan for recovery; cultivated a positive relationship with the ranch owners, which is critical to recovery implementation; contracted with the National Academy of Sciences, National Research Council, for an evaluation of the recovery program; documented and monitored a fledgling crow in the wild; established guidelines for a recovery team; and provided funding and technical assistance to the Olinda facility.

Current Recovery Needs: Active management and manipulation of the wild population, including collection of first-clutch eggs, incubation of the eggs near the wild population, introduction of a portion of the resulting young into the captive flock at the Olinda facility, and hacking of the remaining young into the wild, is needed. Other necessary recovery activities include predator control, disease studies, nutrition studies, and habitat enhancement.

Section 6 Funding and Activities: In both FY 1991 and FY 1992, $80,000 were provided for captive propagation and $80,000 for facility construction at the Olinda facility, which includes facilities for other Hawaiian forest birds.

W.E. Banko

Partnerships

Hawaii Division of Forestry and Wildlife: This State agency operates and maintains the captive breeding facility on Maui. It also reviews and provides technical assistance to Service recovery efforts and has two staff members serving on the 'Alala Recovery Team.

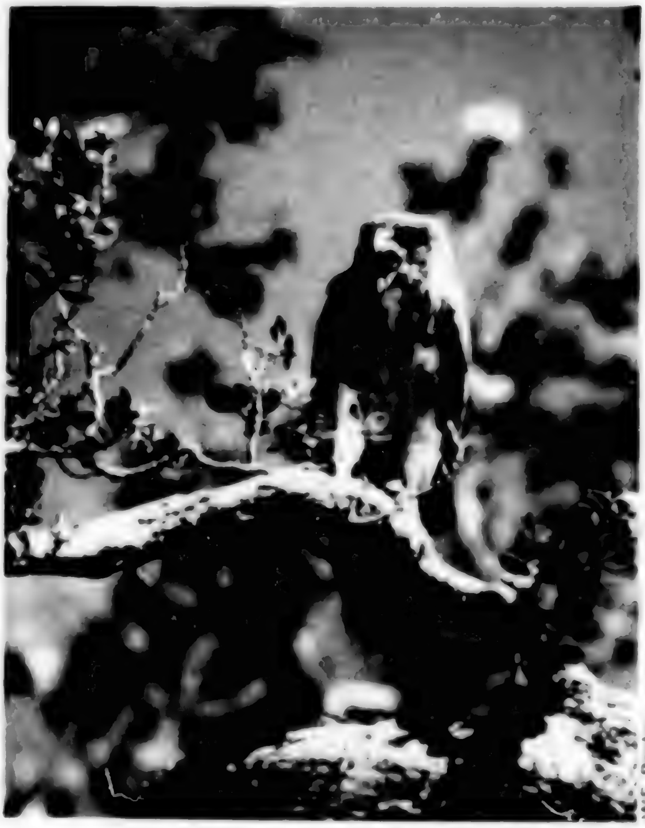
Recovery Plan Status: Plan approved 10/28/82.

Hawaiian Hawk

(*Buteo solitarius*)—Endangered

Current Status: The Hawaiian hawk population is now believed to be stable and large enough that the Fish and Wildlife Service is considering reclassifying the species from endangered to threatened. Threats include harassment and killing by humans, habitat degradation, predation by introduced species (e.g., rats and mongooses) that prey on eggs and juveniles, and introduced diseases and other catastrophic events.

Achievements: The Hawaiian hawk population is believed to number between 1,500 and 2,000, and appears to be stable throughout its range on the island of Hawaii. The apparent increase and stabilization are believed to have resulted from better surveys, reductions in harassment and shooting, management of forest bird habitats (such as Hakalau National Wildlife Refuge and Hawaii Volcanoes National Park), and increased availability of prey.



W.E. Benko

Current Recovery Needs: Recovery of the species will require regular monitoring, enforcement of laws against harassment and killing, predator control, and public education.

Partnerships

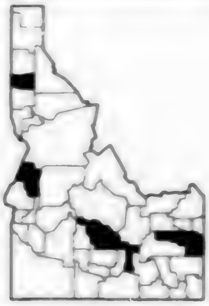
National Park Service: This Federal agency maintains suitable habitat for the Hawaiian hawk in Hawaii Volcanoes National Park, protects nest sites, enforces the prohibition on taking, and monitors population status.

Hawaii Division of Forestry and Wildlife: This State agency's Forest Reserve System on the island of Hawaii has been expanded over the past 2 years to provide additional habitat for the hawk. This agency also continues to enforce laws against taking and harassment, reviews all proposed changes in land use designation, and has an ongoing program for salvaging and rehabilitating injured hawks.

Recovery Plan Status: Plan approved 5/9/84.

Idaho

Species Name	*Status*
Bear, brown (=grizzly)	T
Caribou, woodland	E
Wolf, gray	E
Crane, whooping	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Four-o'clock, MacFarlane's	E



Gray Wolf

(*Canis lupus*)—Endangered

Current Status: Intensive human settlement, loss of habitat, conflicts with domestic livestock, lack of understanding of the wolf's ecology and habits, and superstition have had a major impact on the decline of the wolf and on its recovery. Current threats in Idaho include illegal shooting and poisoning. The poisoning of a female wolf from Bear Valley, Idaho, in 1991 set back wolf recovery in the State. A pair of wolves occupied the area in 1991, before the poisoning, and the Fish and Wildlife Service anticipated pack activity in 1992. However, the Service could not confirm more than transitory use of the area by a wolf in 1992.

Achievements: In 1992, two radio-collared gray wolves were present in Idaho for several weeks in February, and one continues to occupy the Kelly Creek area. This wolf, collared as an adult in Glacier National Park, Montana, in September 1990, dispersed about 150 miles to Kelly Creek in 1991. The second wolf, an adult female from Banff, British Columbia, was radio-located near Lake Pend Oreille, Idaho, for about 2 weeks before returning to Canada. Both of these movements demonstrate how gray wolves are expected to recolonize Idaho by dispersing from adjacent populations in Montana and Canada. The Fish and Wildlife Service received 110 reports of wolf sightings in Idaho in 1991 and 60 in 1992. Wolves were reported in the Red River and Bear Valley areas of central Idaho and portions of the Idaho-Montana border. Pack activity could not be confirmed.

Since 1990, the Service has conducted approximately 100 informal section 7 consultations per year in Idaho with Federal agencies regarding impacts on wolves from such activities as logging, mining, animal damage control, and road management. Potential impacts have been addressed with only slight project modifications.

Current Recovery Needs: To gain acceptance of wolf recovery efforts in Idaho, it will be necessary to monitor the progress of wolf recolonization and implement public information and education programs.

Partnerships

Forest Service: This Federal agency participates on the Central Idaho Wolf Recovery Steering Committee, the Biological/Scientific Subcommittee, and the Information and Education Subcommittee. The Forest Service provided a biologist to assist with wolf monitoring in Bear Valley in 1992. Additionally, Clearwater, Nez Perce, and Payette National Forests conducted surveys for wolves on their lands in 1992.

C.J. Bayer

Bureau of Land Management: The Bureau participates on the Central Idaho Wolf Recovery Steering Committee, the Biological/Scientific Subcommittee, and the Information and Education Subcommittee.

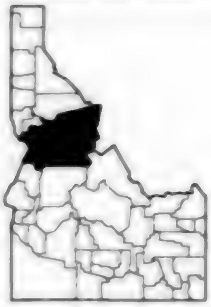
Idaho Department of Fish and Game: The Department participates on the Central Idaho Wolf Recovery Steering Committee and was recently authorized by the State legislature to assist in preparing the environmental impact statement on wolf reintroduction to Yellowstone National Park and central Idaho. Through an interagency agreement, the Fish and Wildlife Service hired two Department biologists to assist with preparing the environmental impact statement.

The Wolf Recovery Foundation and Wolf Haven International: The Foundation assists in information and education about the wolf, and facilitates reporting of wolf sightings to the Fish and Wildlife Service. Wolf Haven International assisted with wolf howling surveys in two national forests in Idaho in 1992, and is soliciting funds from its membership for additional wolf surveys in Idaho.

Recovery Plan Status: Original plan approved 5/28/80; revised 8/3/87.

MacFarlane's Four-o'clock

(*Mirabilis macfarlanei*)—Endangered



Current Status: The number of known individuals rangewide has increased from about 30 plants when listed in 1979 to about 2,300 plants in 1991. Although drought has resulted in smaller plants, as well as fewer flowers and seeds, four-o'clock colonies do not show major declines. Livestock overgrazing and the weedy invasion of exotic plants it encourages continue to be a problem. Pressure from collectors exists also, especially from those interested in introducing the species into "wild gardens." Indiscriminate herbicide spraying is a threat to plants growing near roadsides.

Achievements: Fourteen of the 18 known four-o'clock colonies occur in Idaho, where grazing has been reduced or eliminated on the public lands occupied by this plant. In addition, grazing that could impact one of the largest colonies on private land has been voluntarily reduced by the landowner to help conserve the wildflower. The discovery of additional colonies on public lands, better grazing management, and the stability of existing colonies have reduced threats to this species rangewide. As a result, the Fish and Wildlife Service is considering reclassifying the species from endangered to threatened. In addition, habitat management plans have been implemented for three four-o'clock populations on Bureau of Land Management lands. The Fish and Wildlife Service is coordinating with the Bureau of Land Management and the Forest Service on recovery strategies.

Fred Johnson

Current Recovery Needs: Recovery needs include continued searches for new populations, population monitoring, habitat protection, and further studies on the effects of exotic plant invasions, the impacts of grazing, and the plant's reproductive cycle.

Partnerships

Bureau of Land Management and Forest Service: Actions taken by these Federal agencies under the recovery plan have led to the Service considering reclassifying MacFarlane's four-o'clock from endangered to threatened. The Bureau of Land Management has implemented habitat management plans to conserve plant colonies on its lands, including an experimental transplant site.

Idaho Department of Fish and Game: The Department maintains recovery activity records in its Conservation Data Center.

Recovery Plan Status: Plan approved 3/27/85.

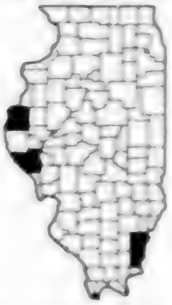
Illinois

Species Name	*Status*
Bat, gray	E
Bat, Indiana	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	E
Tern, least (interior population)	E
Sturgeon, pallid	E
Snail, Iowa Pleistocene	E
Fanshell	E
Pearly mussel, Higgins' eye	E
Pearly mussel (=pimple back), orange-footed	E
Pearly mussel, pink mucket	E
Pearly mussel, tubercled-blossom	E
Pearly mussel, white wartyback	E
Pocketbook, fat	E
Aster, decurrent false	T
Bush-clover, prairie	T
Daisy, lakeside	T
Orchid, eastern prairie fringed	T
Pogonia, small whorled	E
Prairie-clover, leafy	E
Thistle, Pitcher's	T

Illinois

Fat Pocketbook

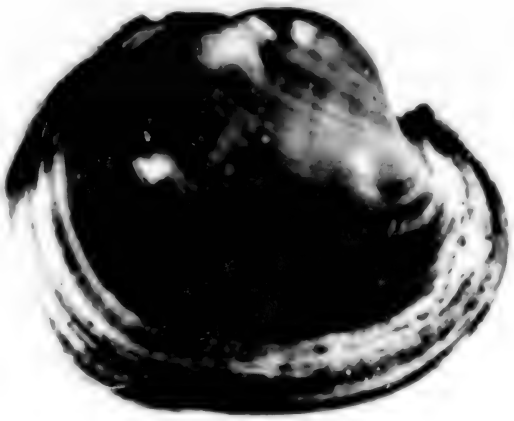
(*Potamilus capax*)—Endangered



Current Status: Introduction of the exotic zebra mussel into the Mississippi River system threatens all of its native mussel species. Suspected to have been a stowaway inside the ballast tanks of a European vessel, the zebra mussel's ability to attach itself to any hard surface (including the shells of native mussels) and its rapid reproduction rate already have decimated native species. Other factors impacting the fat pocketbook mussel include sedimentation, pollution, commercial barge traffic, commercial clamming, and shoreline and near-shore development for barge fleets and other commercial projects.

Achievements: The lower Wabash River population has been surveyed to assess its viability, with more than 70 fat pocketbook mussels located and marked. A general mussel survey of the Ohio River is being conducted by the Army Corps of Engineers' Louisville District, and a study to determine the fish host for the parasitic larval stage of this species is being conducted by the Illinois Department of Conservation.

Current Recovery Needs: The recovery objective for this species requires the existence of at least two viable populations outside the St. Francis River system in Arkansas and Missouri. If the lower Wabash River population can be preserved, it will represent one of the two required populations.



Kevin S. Cummings

Section 6 Funding and Activities: The Illinois Department of Conservation received $9,096 in FY 1991 to conduct a status survey of the fat pocketbook and determine its fish host(s).

Partnerships

Army Corps of Engineers: This Federal agency is conducting a general mussel survey of the Ohio River that may provide data on the distribution of the fat pocketbook.

Illinois Department of Conservation and Illinois State Natural History Survey Division: These State agencies are jointly responsible for ongoing surveys and studies of the fat pocketbook.

Recovery Plan Status: Original plan approved 10/4/85; revised 11/14/89.

Indiana

Species Name	*Status*
Bat, gray	E
Bat, Indiana	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	E
Tern, least (interior population)	E
Fanshell	E
Pearly mussel, pink mucket	E
Pearly mussel, tubercled-blossom	E
Pearly mussel, white cat's paw	E
Pearly mussel, white wartyback	E
Pocketbook, fat	E
Butterfly, Mitchell's satyr	E
Clover, running buffalo	E
Milkweed, Mead's	T
Thistle, Pitcher's	T

Indiana

Bald Eagle

(*Haliaeetus leucocephalus*)—Endangered

FWS File Photo

Current Status: The number of eagles in Indiana has increased 35 percent since 1989. The 1992 winter survey reported a record 101 bald eagles in the State. Threats to the eagle in Indiana continue to be loss of habitat, shooting, trapping, disease, poison, electrocution, and environmental contaminants. Human disturbance is suspected as the cause for reproductive failures and abandonment of wintering areas.

Achievements: In 1991, two eaglets that hatched in Indiana survived in the wild, the first time this had happened since 1897. In 1992, for the first time ever in Indiana, a captive-bred eaglet was placed in a nest in the wild and accepted by the nesting parents.

Current Recovery Needs: The bald eagle will need continued monitoring in Indiana, and nesting and winter roosting sites will need continued protection.

Section 6 Funding and Activities: In FY 1992, $16,200 was provided to the Indiana Department of Natural Resources for eagle winter habitat assessment. The estimated completion date for the assessment is December 1993.

Partnerships

Indiana Department of Natural Resources: This State agency conducts annual midwinter bald eagle surveys to determine trends and monitors nests continuously

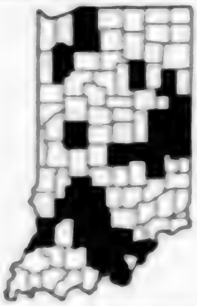
Columbus Zoo: In cooperation with the Indiana Department of Natural Resources, the zoo is conducting a captive breeding program for the bald eagle. One eaglet from this program was released to the wild in 1992.

Recovery Plan Status: Plan approved 7/29/83.

Indiana

Indiana Bat

(*Myotis sodalis*)—Endangered



Current Status: Human disturbance of hibernating Indiana bats by cavers, researchers, and vandals account for most of the species' decline, although deforestation and stream channelization are also factors. The role of contaminants is unclear for the Indiana bat; however, pesticides have been shown to decrease the number of many insectivorous North American bats. Natural threats to this bat include flooding of hibernacula (caves), collapse of hibernacula ceilings, and hypothermia induced by severe winters.

Achievements: Since the 1990 recovery report, the Indiana population of Indiana bats has increased 18 percent. Activities such as educational posting at cave entrances and cave gating have contributed to this population increase. Two formal section 7 interagency consultations have been carried out, one with the Federal Aviation Administration on a major airport expansion project and one with the Soil Conservation Service on a flood control/stream channelization project. Both consultations resulted in no-jeopardy biological opinions, and reasonable and prudent measures suggested by the Fish and Wildlife Service to minimize incidental take were adopted.

Current Recovery Needs: Recovery needs include protecting hibernacula, protecting and restoring summer nursery habitat, monitoring population trends, educating the public, and continuing research on Indiana bat ecology and biology.

Al Hicks

Section 6 Funding and Activities: In FY 1991, the Indiana Department of Natural Resources received $25,182 to census Indiana bats, complete a study of overwinter weight loss in hibernating bats, and gate important hibernacula. The $24,940 provided in FY 1992 went to additional cave gating, a study of summer habitat, and preparation of a comprehensive final project report.

Partnerships

Department of the Army: The Army is conducting a comprehensive survey of the Indiana bat population at Fort Benjamin Harrison, Indianapolis.

Indiana Department of Natural Resources: The Department is conducting projects such as population censusing, cave management, biological studies, and summer habitat studies. Management activities (e.g., gate maintenance and educational posting) afford protection to the Indiana bat. Landowner coordination for long-term protection of another important hibernaculum is under way.

Indiana Karst Conservancy: The owner of property containing several caves, this group protects Indiana bats and coordinates with the Indiana Department of Natural Resources for visitations during population surveys. Also, group volunteers provide help in gate construction.

Recovery Plan Status: Original plan approved 6/1/76; revised 10/14/83.

Indiana

Least Tern (Interior Population)

(*Sterna antillarum*)—Endangered

Luther C. Goldman

Current Status: Habitat alteration, most frequently caused by channelization, irrigation, and reservoir construction, has eliminated many sandbars used for nesting. Certain recreational activities along riverways also disrupt nesting.

Achievements: The State's least tern population successfully nested during the past 2 years due to intervention to eliminate human disturbance, discourage predation, and reduce encroaching vegetation.

Current Recovery Needs: Determining the species' distribution and population trends, as well as its habitat requirements and status, are important. Of equal importance is the protection of least tern populations during the breeding season. There is also need for a public education program on the species and what can be done to aid its recovery.

Section 6 Funding and Activities: The Indiana Department of Natural Resources received $7,200 in FY 1991 and $5,400 in FY 1992 to survey and manage the State's least tern population. In FY 1991, program money was used to survey and monitor existing colonies; in FY 1992, the tern colony received protection from human disturbance.

Partnerships

Indiana Department of Natural Resources: This State agency controls vegetation, maintains nesting substrate, and protects least tern nurseries from human disturbance. Surveying and monitoring of tern colonies will be completed in December 1992. In 1990, a gate was installed and signs posted to protect terns during the nesting season.

PSI Energy: This company voluntarily controls vegetation on, and access to, the tern colony nesting on its property.

Recovery Plan Status: Plan approved 9/19/90.

Running Buffalo Clover

(*Trifolium stoloniferum*)—Endangered

Current Status: Threats to the survival of the running buffalo clover include habitat destruction, competition from nonnative plants, the absence of a rhizobial symbiote, disease, and predation.

Achievements: The Indiana Department of Natural Resources has reached an agreement with a landowner to protect one of the two known populations of running buffalo clover.

Current Recovery Needs: Recovery criteria to protect the running buffalo clover include protecting occupied habitat and populations, inventorying known populations, surveying for additional populations, determining and implementing habitat management techniques, augmenting existing populations and establishing new ones, conserving genetic diversity, and providing public information.

Partnerships

Indiana Department of Natural Resources: The Department has continued surveys for new populations and has collected material for cultivation at the Missouri Botanical Garden and ultimate planting at Versailles State Park.

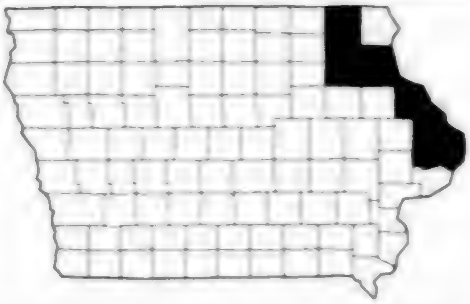
The Nature Conservancy: The Conservancy's contact with property owners resulted in an agreement that protects one population of the plant.

Recovery Plan Status: Plan approved 6/8/89.

M. Homoya

Iowa

Species Name	*Status*
Bat, Indiana	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, least (interior population)	E
Sturgeon, pallid	E
Snail, Iowa Pleistocene	E
Pearly mussel, Higgins' eye	E
Pocketbook, fat	E
Bush-clover, prairie	T
Milkweed, Mead's	T
Monkshood, northern wild	T
Orchid, eastern prairie fringed	T
Orchid, western prairie fringed	T



Iowa Pleistocene Snail

(*Discus macclintocki*)—Endangered

Current Status: Slope clearing, use of habitat as pasture, human traffic, and predation by shrews are the principal threats to this survivor from the Ice Age.

Achievements: Algific slopes support Iowa Pleistocene snails and other unusual species. These steep slopes are comprised of talus at the base and are connected to upslope sinkhole drainage systems; cold moist air moves through the system and percolates out around the talus. Approximately 281 acres of slope sites supporting the snail have been purchased as part of a multi-agency acquisition program involving the Fish and Wildlife Service, Iowa Department of Natural Resources, and The Nature Conservancy. A prospectus has been prepared for management of these slopes as inclusions in the Driftless Area National Wildlife Refuge. Critical areas are being fenced to prevent grazing and human foot traffic.

Current Recovery Needs: Additional purchase of habitat and fencing is needed, as well as continued monitoring to determine population status and extent of threats.

FWS File Photo

Section 6 Funding and Activities: In both FY 1991 and FY 1992, the Iowa Department of Natural Resources received $9,000 to fence algific slope sites and monitor populations of the Iowa Pleistocene snail. This also benefits another endangered species, the northern wild monkshood (*Aconitum noveboracense*).

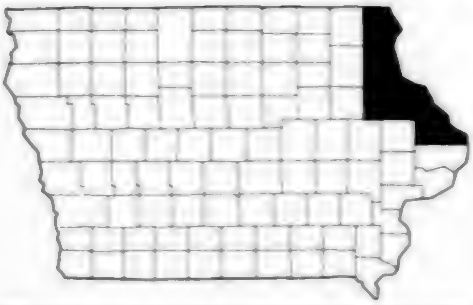
Partnerships

Iowa Department of Natural Resources: The Department has purchased and protected several algific slopes containing this species in a continuing effort to provide for its protection.

The Nature Conservancy: The Conservancy purchased eight algific slope sites, then transferred three to the Fish and Wildlife Service. The Conservancy continues to monitor the species and contact landowners to secure protection of other algific slope sites.

Recovery Plan Status: Plan approved 3/22/84.

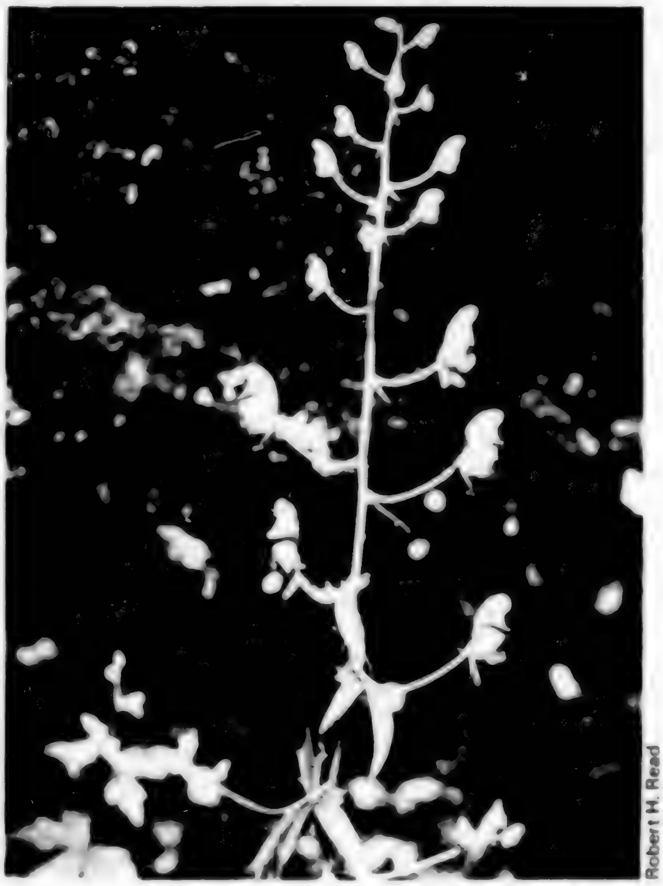
Iowa



Northern Wild Monkshood

(*Aconitum noveboracense*)—Threatened

Current Status: Logging and trampling by humans and livestock threaten this member of the buttercup family, whose widely separated populations probably date to the Ice Age when glaciers apparently destroyed intervening populations.



Robert H. Read

Achievements: The Fish and Wildlife Service has purchased 110 acres of algific slopes, favored by the monkshood, for inclusion in the Driftless Area National Wildlife Refuge. Algific slopes are steep slopes comprised of talus at the base and connected to upslope sinkhole drainage systems; cold moist air moves through the system and percolates out around the talus. A prospectus also has been prepared for management of these additional acres. All high priority slopes have been examined, threats identified, management recommendations made, and acquisition boundaries laid out. Monkshood populations are being fenced to protect them from human and animal traffic on refuge and private lands.

Current Recovery Needs: Additional purchase of habitat and fencing is needed, as well as continued species monitoring to determine population status and extent of threats.

Section 6 Funding and Activities: In FY 1991, the State received $9,000 for fencing to protect the algific slopes supporting the plant. The fencing also benefitted the endangered Iowa Pleistocene snail (*Discus macclintocki*).

Partnerships

Iowa Department of Natural Resources: The Department has purchased and protected several algific slopes containing this species.

The Nature Conservancy: The Conservancy purchased six algific slopes, then transferred one site to the Fish and Wildlife Service for incorporation into the Driftless Area National Wildlife Refuge. The Conservancy continues to monitor the monkshood and contact landowners to secure protection of other algific slope sites.

Recovery Plan Status: Plan approved 9/23/83.

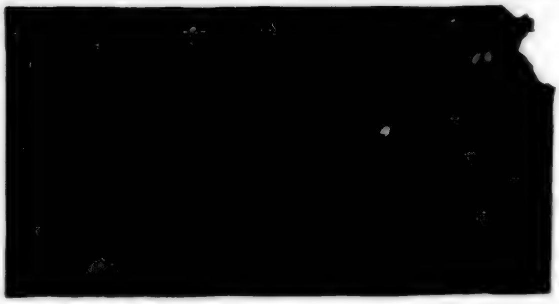
Kansas

Species Name	*Status*
Bat, gray	E
Bat, Indiana	E
Crane, whooping	E
Curlew, Eskimo	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, least (interior population)	E
Vireo, black-capped	E
Madtom, Neosho	T
Sturgeon, pallid	E
Clover, running buffalo	E
Milkweed, Mead's	T
Orchid, western prairie fringed	T

Kansas

Bald Eagle

(*Haliaeetus leucocephalus*)—Endangered



Current Status: Primary threats to the bald eagle in Kansas include loss of important riparian wintering habitat, powerlines that present an electrocution hazard, and intentional shooting.

Achievements: No nesting bald eagle pairs had been reported in Kansas this century until an adult pair successfully nested in eastern Kansas in 1989. In 1990, two pairs successfully nested, the 1989 pair and a second pair in the western part of the State. Both pairs have been monitored annually, and some of the progeny and one adult have been banded. The two nesting areas are being protected from human disturbance. Several additional potential nesting locations have been discovered. These may be evidence of young birds beginning to establish territories for future nesting. A formal section 7 consultation with the Federal Highway Administration resulted in a no-jeopardy biological opinion with reasonable and prudent measures to avoid or minimize incidental take of eagles (through harassment from construction or tree removal) by protecting and restoring riparian habitat. Additionally, several informal section 7 consultations with rural electric cooperatives resulted in the dissemination of important information about raptor-proofing powerlines.

Current Recovery Needs: The primary needs for recovering the bald eagle in Kansas are protection and maintenance of habitat, including both wintering areas and newly established nesting territories. Additionally, nesting eagles will need continued monitoring. Work with rural electric cooperative associations is needed to ensure that new or revised powerlines are equipped with raptor protection measures.

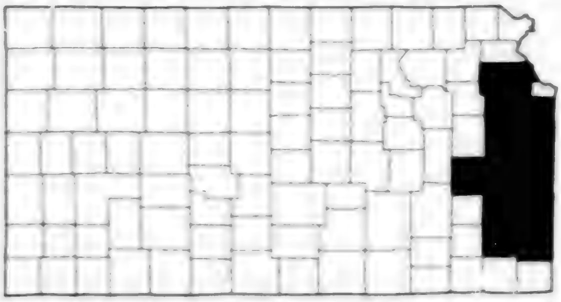
Partnerships

Army Corps of Engineers: The Corps owns and manages Clinton Reservoir, the site of the first documented bald eagle nest site in Kansas in over 100 years. The Corps has cooperated with the Fish and Wildlife Service to identify a zone of protection around the nest, post information and warning signs, and place floating buoys around the protected nest area. Corps personnel also have assisted in trapping and banding efforts each year.

Paul W Sykes, Jr.

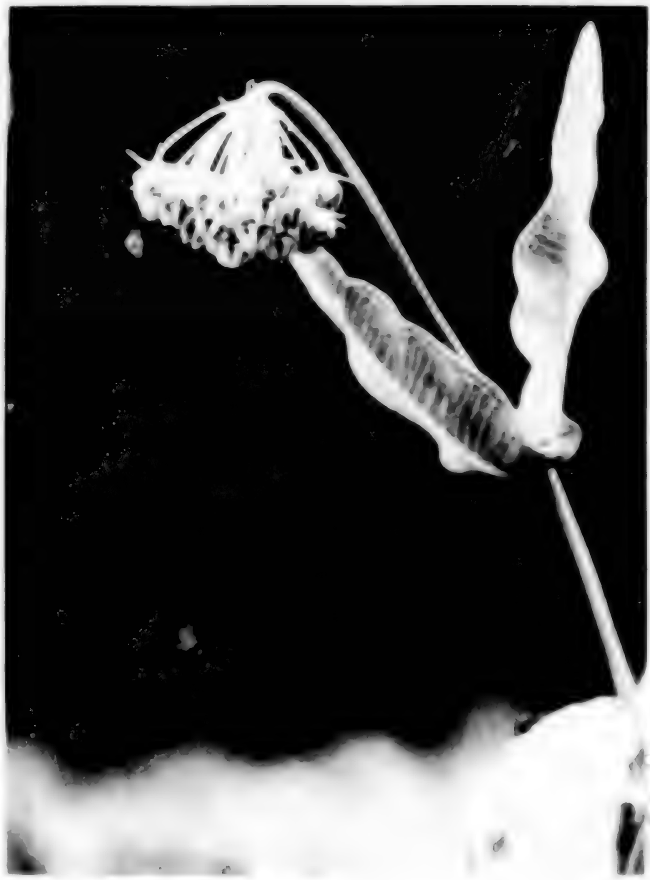
Kansas Department of Wildlife and Parks: This State agency is responsible for protecting and conserving all State and federally listed endangered and threatened species. The Department has coordinated all protection efforts for both bald eagle nests and has begun a multi-year survey of wintering bald eagles to identify the most frequently used riparian areas.

Recovery Plan Status: Plan approved 7/29/83.



Mead's Milkweed

(*Asclepias meadii*)—Threatened



John Schwegman

Current Status: Loss of habitat through the conversion of native meadows to other land uses is the primary threat to this species.

Achievements: The Fish and Wildlife Service is preparing a cooperative agreement with the Army Corps of Engineers to allow populations of the milkweed threatened by development projects to be transplanted onto Corps property.

Current Recovery Needs: A primary need is public education and information on the value of Mead's milkweed and its habitat. Also, more surveys are needed to determine the full extent of this species' presence in Kansas.

Partnerships

Army Corps of Engineers: The Corps owns and maintains land surrounding several Federal reservoirs, property on which Mead's milkweed may be transplanted pursuant to a cooperative agreement now being prepared.

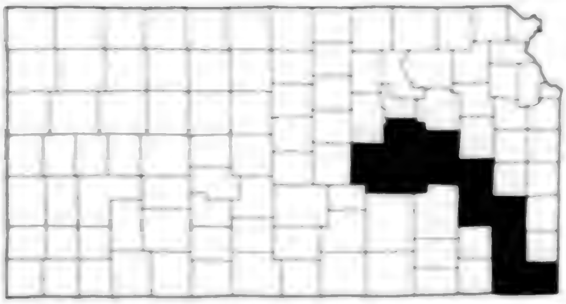
Kansas Biological Survey: The Kansas Biological Survey will provide technical assistance, particularly on population locations and transplanting techniques, if Mead's milkweed plants are transplanted onto Corps properties.

Recovery Plan Status: Technical draft plan.

Kansas

Neosho Madtom

(*Noturus placidus*)—Threatened



Current Status: Impoundments pose a potential threat to this fish by isolating population segments and altering flow and other habitat characteristics. Commercial dredging for river gravel removes riffle habitat and may destroy madtoms directly as well. Pollution from feedlots and agricultural runoff, municipal and industrial sewage effluent, accidental spills at bridge crossings, the Wolf Creek Nuclear Generating Station, and the Cherokee County Superfund Site clean-up operations also pose a threat.

Achievements: Results of a habitat and distribution study should quantify microhabitat preferences and population densities in four selected river reaches within the madtom's range. Oklahoma State University conducted a survey of the State's Neosho River, resulting in two additional site records within the species' known range. Section 7 consultations with the Federal Highway Administration regarding highway bridge construction over the Neosho River produced a design plan that avoided impacts to the madtom. The Fish and Wildlife Service also consulted with the Soil Conservation Service on tributary watershed dam construction within the Cottonwood River Basin. Design changes and a monitoring study were implemented to determine what effect, if any, to expect, and how best to offset any adverse effects.

Current Recovery Needs: Determining population size and mobility; assessing the degree of competition with other species, especially with the slender madtom (*Noturus exilis*); and protecting minimum streamflows in the Neosho, Cottonwood, and Spring Rivers are priorities.

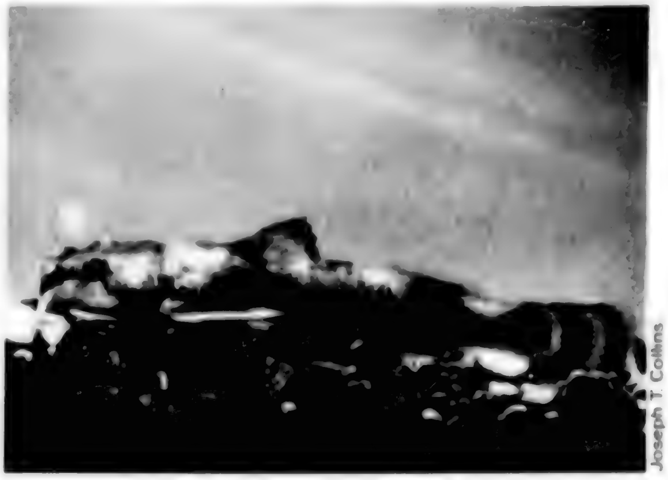
Section 6 Funding and Activities: The Kansas Department of Wildlife and Parks received $40,000 in FY 1992 for two Neosho madtom projects, one to study inter-riffle movements and the other to survey the Spring River to determine the effects of pollution on the species.

Partnerships

Soil Conservation Service, Army Corps of Engineers, Environmental Protection Agency, and Federal Highway Administration: Responsible for proper streamflows and habitat protection, these agencies are beginning programs for the madtom. The Federal Highway Administration is working with the Fish and Wildlife Service through the Kansas Department of Transportation.

Kansas Department of Wildlife and Parks: The Department has a moratorium on issuing State permits for commercial gravel removal in Neosho madtom habitat. It is studying the effectiveness of constructing artificial riffles in madtom streams to determine the potential for mitigation when a project makes riffle degradation unavoidable.

Recovery Plan Status: Plan approved 9/30/91.



Joseph T. Collins

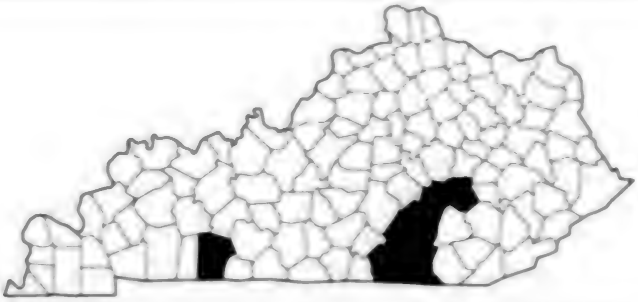
Kentucky

Species Name	*Status*
Bat, gray	E
Bat, Indiana	E
Bat, Virginia big-eared	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, least (interior population)	E
Woodpecker, red-cockaded	E
Dace, blackside	T
Sturgeon, pallid	E
Fanshell	E
Mussel, ring pink (=golf stick pearly)	E
Pearly mussel, cracking	E
Pearly mussel, Cumberland bean	E
Pearly mussel, dromedary	E
Pearly mussel, little-wing	E
Pearly mussel (=pimple back), orange-footed	E
Pearly mussel, pink mucket	E
Pearly mussel, purple cat's paw	E
Pearly mussel, tubercled-blossom	E
Pearly mussel, white wartyback	E
Pigtoe, rough	E
Pocketbook, fat	E
Riffle shell, tan	E
Shrimp, Kentucky cave	E
Beetle, American burying (=giant carrion)	E
Clover, running buffalo	E
Goldenrod, Short's	E
Goldenrod, white-haired	T
Potato-bean, Price's	T
Rosemary, Cumberland	T
Sandwort, Cumberland	E
Spiraea, Virginia	T

Kentucky

Little-wing Pearly Mussel

(*Pegias fabula*)—Endangered



Current Status: The little-wing pearly mussel faces water quality degradation resulting from industrial and sewage effluents and the runoff of silt and other water pollutants from poorly designed construction, development, mining, agricultural, and forestry activities. Further, the spread of the exotic zebra mussel (*Dreissena polymorpha*) represents a potential threat to the survival of this species. Zebra mussels outcompete native mussel fauna, and infestations in the water column can physically disrupt normal breeding and feeding behavior.

Achievements: Although little measurable progress has been made in establishing new mussel populations or in stabilizing existing populations, substantial recovery efforts for all the State's federally listed mussels are under way. Research is continuing on maintaining captive mussel populations, mussel cryopreservation, and potential impacts of the exotic zebra mussel on native mussels.

Current Recovery Needs: Recovery of the little-wing pearly mussel will require additional research to develop new propagation techniques, reintroduction into unoccupied historical habitat, and determination of the factors that are causing declines in the wild. Also, technology is needed for cryopreservation of freshwater mussel genetic material.

Section 6 Funding and Activities: In both FY 1991 and FY 1992, the State of Kentucky received $15,120 to evaluate the impact of commercial mussel fishing on federally listed mussels in the State. In FY 1992, the State also received $7,500 to conduct a status survey on listed mussels.

Partnerships

Forest Service: This Federal agency is working with The Nature Conservancy to purchase private lands within the boundaries of the Daniel Boone National Forest in the Horse Lick Creek watershed to protect the little-wing pearly mussel. The Forest Service has also collected information on the distribution of, and threats to, federally-listed mussels within this watershed.

Dick Biggins

Kentucky Department of Fish and Wildlife Resources: This State agency is responsible for managing the State's mussel populations, managing an extensive commercial mussel fishery, maintaining a geographic data base on mussel distribution, and designating mussel sanctuaries to protect State and federally listed mussels.

Kentucky State Nature Preserves Commission: The Kentucky State Nature Preserves Commission, another State agency, is responsible for maintaining a geographic data base on the distribution of mussels. It also purchases and protects important mussel sites and conducts surveys to identify the distribution and abundance of native mussels. By maintaining a natural history data base, the Commission provides valuable information on federally listed mussels, and through its environmental review process and site surveys it helps protect these species.

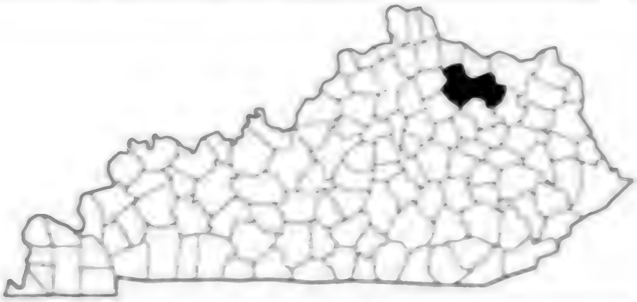
The Nature Conservancy: This private organization has an active land protection program in the Horse Lick Creek watershed for protecting the little-wing pearly mussel, and has funded a project to survey the mussel fauna of this system.

Recovery Plan Status: Plan approved 9/22/89.

Kentucky

Short's Goldenrod

(*Solidago shortii*)—Endangered



Current Status: The species' highly restricted distribution and limited numbers make it vulnerable to extinction. Current threats include inadvertent trampling and destruction, overcollecting for scientific purposes, habitat loss or adverse modification of habitat, and uncontrolled fire.

Achievements: Two of the known Short's goldenrod sites have received permanent protection, one through acquisition by The Nature Conservancy and the other through formal dedication as a nature preserve by the Kentucky State Nature Preserves Commission. Three additional sites have been registered with the Kentucky State Nature Preserves Commission. The Kentucky State Nature Preserves Commission has a program, in cooperation with the Governor's Office, to encourage landowners to register their lands as environmentally significant areas. The program is strictly voluntary and non-binding, but provides private landowners with public service awards for managing their lands for endangered species. Life history and ecological requirements studies have been completed, and research into management needs has been initiated.

John R. MacGregor

Current Recovery Needs: Necessary recovery actions include obtaining permanent protection of known Short's goldenrod sites, determining and implementing long-term management needs, and discovering or establishing additional populations.

Partnerships

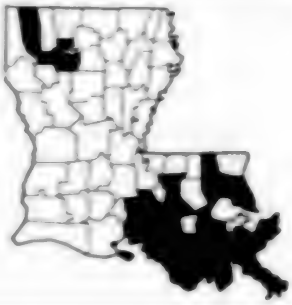
Kentucky State Nature Preserves Commission: The Commission works with The Nature Conservancy to purchase land or obtain conservation easements to protect federally listed plants, including Short's goldenrod. In FY 1992, the Commission initiated a project (funded by the Fish and Wildlife Service) to determine effective and efficient procedures for managing the species. The Service also funded a project to conduct searches for other populations and to identify potential reintroduction sites.

The Nature Conservancy: Through its land protection program in Kentucky, the Conservancy manages land it has purchased to protect Short's goldenrod. Additional sites for the species may be acquired as funds are available and opportunities arise.

Recovery Plan Status: Plan approved 5/25/88.

Louisiana

Species Name	*Status*
Bear, Louisiana black	T
Manatee, West Indian (=Florida)	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Pelican, brown	E
Plover, piping	T
Tern, least (interior population)	E
Woodpecker, red-cockaded	E
Tortoise, gopher	T
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, Kemp's (=Atlantic) ridley sea	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Turtle, ringed sawback	T
Sturgeon, Gulf	T
Sturgeon, pallid	E
Heelsplitter, inflated	T
Pearlshell, Louisiana	E
Pondberry	E



Bald Eagle

(*Haliaeetus leucocephalus*)—Endangered

Current Status: Threats to the bald eagle include loss of habitat and disturbance of nest sites. Because most nests in the State are concentrated within a relatively small area, hurricanes could have a devastating effect on the species, especially during the nesting season.

Achievements: The bald eagle has achieved significant recovery in Louisiana since it was listed. During the 1991-1992 nesting season, the Louisiana Department of Wildlife and Fisheries surveyed 60 active nests (up from the 17 nests found in the 1984-1985 season), with an estimated 95 young. The ban on organochlorine compounds has contributed to the species' recovery. Also, disturbance to nests has been reduced through section 7 consultations. During the 1991-1992 nesting season, the Fish and Wildlife Service and the Louisiana Department of Wildlife and Fisheries worked cooperatively to capture and relocate young eagles to the Lake Ophelia National Wildlife Refuge. Fourteen eaglets were taken, housed in a hacking tower, and cared for until release. All 14 successfully fledged from the tower and have since left the immediate area. It is hoped this hacking will establish an eagle population at the Lake Ophelia Refuge. This effort was funded partially with private donations.

FWS File Photo

Current Recovery Needs: The bald eagle will need continued population monitoring and habitat protection, and improved communication with the public to obtain information on eagle nests. Additionally, eagles will continue to be relocated to suitable unoccupied habitat.

Partnerships

Louisiana Department of Wildlife and Fisheries: This State agency monitors and inventories eagle nests, and conducts public education and information programs. As mentioned above, the Department participated in a hacking program during the 1991-1992 nesting season.

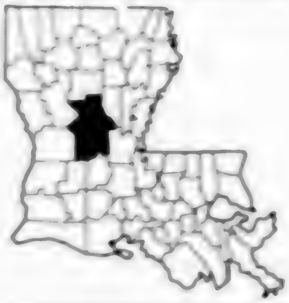
The Nature Conservancy: With funding provided by the Louisiana Department of Wildlife and Fisheries, the Conservancy has contacted landowners who have eagle nests on their property. They are offered an opportunity to register land encompassing nesting territory with the Louisiana Natural Areas Registry. In registering the property, the landowner agrees not to alter the area in a manner detrimental to the eagle's survival.

Recovery Plan Status: Plan approved 8/3/84.

Louisiana

Louisiana Pearlshell

(*Margaritifera hembeli*)—Endangered



Current Status: When this mussel was listed in 1988, it was thought to be restricted to 11 streams in the Bayou Beouf drainage, with nearly 90 percent occurring in 4 streams. Surveys in 1991 and 1992, however, also found this species in eight streams within the Red River system, a major tributary of the Mississippi River. This new discovery extends the known range substantially. Additionally, the population in the Red River drainage appears to be larger than that in the Bayou Beouf drainage.

FWS File Photo

Achievements: The Forest Service and the Louisiana Department of Wildlife and Fisheries have been involved in efforts to determine populations of the Louisiana pearlshell and to provide protection for its habitat.

Current Recovery Needs: Although this mussel has been found to occur more widely than was believed in 1988, when it was listed, it will need continued monitoring, habitat protection, and life history research.

Section 6 Funding and Activities: In FY 1991, the Louisiana Department of Wildlife and Fisheries received $2,500 to conduct a survey of the Bayou Beouf population of the Louisiana pearlshell for comparison with results of population surveys conducted prior to the listing.

Partnerships

Forest Service: This Federal agency seeks to conserve this species during its timber management operations. The Forest Service has also provided funding for several studies of this species.

Louisiana Department of Wildlife and Fisheries: This State agency has monitored the status of the Louisiana pearlshell and worked with the Forest Service to remove beavers from streams where pearlshells occur to prevent the construction of dams that would stop the flow of water. It is believed that this mussel cannot survive in impounded conditions.

Recovery Plan Status: Plan approved 12/3/90.

Maine

Species Name	*Status*
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, roseate	E
Lousewort, Furbish	E
Orchid, eastern prairie fringed	T
Pogonia, small whorled	E

Maine

Bald Eagle

(*Haliaeetus leucocephalus*)—Endangered

Current Status: In spite of persisting organochlorine contaminant problems and lower than average reproductive success (less than 1.0 young per active nest), the nesting population continues to increase in Maine and throughout the region. In 1992, 140 territorial pairs were known to exist in Maine. Continuing threats include habitat loss/modification and human disturbance.

FWS File Photo

Achievements: In 1991, the State of Maine designated 32 additional nest sites as essential habitat under the State endangered species law, bringing the number of sites protected to 186. Additionally, the Fish and Wildlife Service has initiated a major contaminants study of Maine eagles and their prey. Blood samples, addled eggs, and several prey species are being analyzed for organochlorines, mercury, and dioxins.

Current Recovery Needs: Current programs of species monitoring, habitat protection, and contaminant studies should be continued.

Section 6 Funding and Activities: The Maine Division of Inland Fisheries and Wildlife received $35,000 in both FY 1991 and FY 1992 for population monitoring, nest surveys, banding, landowner contacts, and continued work on essential habitat designation.

Partnerships

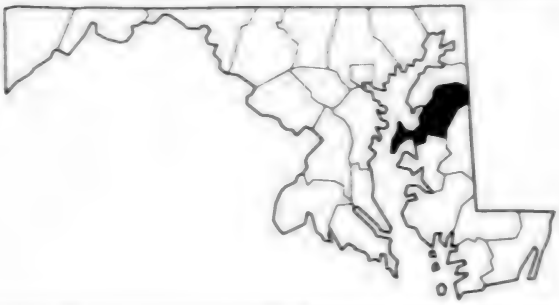
Maine Division of Inland Fisheries and Wildlife: This State agency monitors eagle populations, conducts surveys, bands birds, designates essential habitat, and contacts landowners regarding their legal responsibilities and management options.

Recovery Plan Status: Plan approved 7/29/83.

Maryland

Species Name	*Status*
Bat, Indiana	E
Squirrel, Delmarva Peninsula fox	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Turtle, hawksbill sea (=carey)	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Darter, Maryland	E
Mussel, dwarf wedge	E
Beetle, northeastern beach tiger	T
Beetle, Puritan tiger	T
Bulrush, northeastern (=barbed bristle)	E
Dropwort, Canby's	E
Gerardia, sandplain	E
Harperella	E
Joint-vetch, sensitive	T
Pink, swamp	T
Pogonia, small whorled	E

Maryland



Canby's Dropwort

(*Oxypolis canbyi*)—Endangered

Nora Murdock

Current Status: Although it occurs on a protected site, the small Maryland population is vulnerable to changes in the use of surrounding lands.

Achievements: In 1989, Maryland's only population of this rare plant had decreased to only three individuals. In order to conserve the genetic resources of the Maryland population, two of these individuals were removed and transported to the North Carolina Botanical Gardens, where they flourished. Rhizomes from the two plants had produced some 50 to 60 plants by 1992. Half of these plants will be used to augment the Maryland population, currently consisting of 13 plants.

Current Recovery Needs: The species' site in Maryland will need continued close monitoring and management. Hydrological and vegetational studies of its habitat might be appropriate in the future.

Section 6 Funding and Activities: In FY 1992, the Maryland Natural Heritage Program received $1,000 for propagation and monitoring of Canby's dropwort.

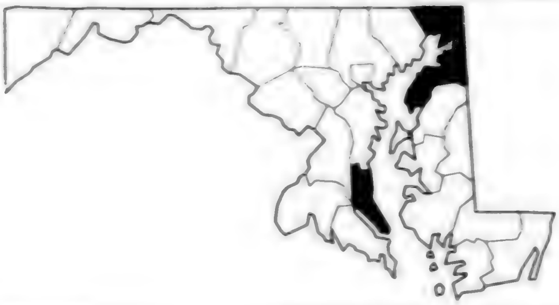
Partnerships

Maryland Natural Heritage Program: This program propagates the species and monitors the wild population.

The Nature Conservancy: This private organization purchased the single Maryland site of Canby's dropwort.

Recovery Plan Status: Plan approved 4/10/90.

Maryland



Puritan Tiger Beetle

(*Cicindela puritana*)—Threatened

Current Status: This species occurs along certain Chesapeake Bay beaches backed by eroding sand/clay cliffs. The larvae burrow into the bare cliff faces, where they may remain for 2 years before emerging as adults. Many cliff sections are being stabilized with bulkheads and riprap, rendering them unsuitable as larval habitat. Other threats include increased human foot traffic on beaches.

Achievements: A formal section 7 consultation on a cliff stabilization project proposed by the Girl Scout Council at one of its camps in Cecil County resulted in protection for the beetles, compensation for the Girl Scouts (The Nature Conservancy is buying an easement on the property), and education for the campers. Their theme for the summer session was "Beetlemania," portrayed by an originally designed beetle logo. Special sessions for the Girl Scouts were set up to discuss the beetle and its needs. Calvert County, where most of the remaining beetle populations occur, has formed a commission that will study the importance of cliffs to the beetles and other organisms, and develop policy regarding cliff protection. In addition, the recovery plan for the Puritan tiger beetle is in its final stages of preparation.

Current Recovery Needs: Continued monitoring and habitat protection are the species' greatest needs.

Thomas D. Schultz

Section 6 Funding and Activities: The Maryland Department of Natural Resources (Forest, Park, and Wildlife Service) received $7,500 in FY 1991 and $5,000 in FY 1992 for monitoring the beetle and conducting a landowner contact program.

Partnerships

Maryland Department of Natural Resources: The Maryland Department of Natural Resources (Maryland Natural Heritage Program) has monitored and assessed impacts on this species. It has also analyzed land ownership and use patterns in beetle habitat and identified high priority sites for conservation, as well as supplied management recommendations for those sites.

Private researchers: Private researchers have conducted detailed ecological studies, as well as studies to determine the impacts of varying levels of human foot traffic on beetle larvae.

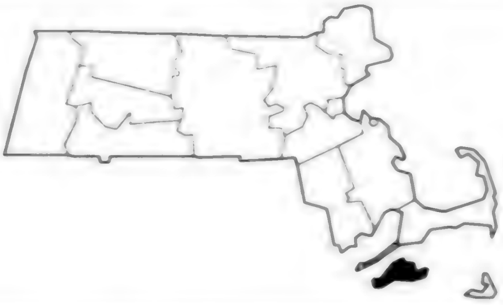
Recovery Plan Status: Technical draft plan.

Massachusetts

Species Name	*Status*
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, roseate	E
Turtle, hawksbill sea (=carey)	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Turtle, Plymouth red-bellied	E
Mussel, dwarf wedge	E
Beetle, American burying (=giant carrion)	E
Beetle, northeastern beach tiger	T
Beetle, Puritan tiger	T
Bulrush, northeastern (=barbed bristle)	E
Gerardia, sandplain	E
Pogonia, small whorled	E

American Burying Beetle

(*Nicrophorus americanus*)—Endangered



Current Status: The species is vulnerable to extinction primarily because of a drastic reduction in its range. Historically, the species' range covered 35 States and 3 Canadian Provinces. Currently, populations are known to occur in only three or perhaps four States.

Achievements: The last documented record for American burying beetles in Massachusetts is a single specimen from Penikese Island in Buzzards Bay during 1947. For the past 3 years, American burying beetles from Block Island, Rhode Island, have been bred at Boston University and released on Penikese Island. This is the first such restoration effort for this species and one of only a few in the United States involving endangered insects. More than 150 American burying beetles have been released on Penikese Island, and while results are preliminary, natural recruitment is occurring and the outlook is optimistic.

The greatest recovery achievement for this species in the past 2 years has been the greatly expanded survey efforts in the Midwest, and the resulting discovery of beetles in eastern Oklahoma and western Arkansas. A few specimens have also been observed in north central Nebraska. With these populations, the species appears to be more secure than at the time of listing.

Current Recovery Needs: Necessary recovery actions include reestablishment of populations within the beetle's former range, conducting surveys for additional populations, monitoring and protecting any newly discovered populations, identifying potential reintroduction sites, and completing genetic studies. Monitoring of the Penikese Island population should continue to determine if the pilot reintroduction effort will result in a self-sustaining population.

Section 6 Funding and Activities: The Massachusetts Division of Fisheries and Wildlife received $1,000 in both FY 1991 and FY 1992 to coordinate the Penikese Island reintroduction.

FWS File Photo

Partnerships

Massachusetts Division of Fisheries and Wildlife: Division personnel coordinated the Penikese Island reintroduction effort.

Boston University: The University raised beetles for the Penikese Island reintroduction and successfully released them. It also prepared a captive breeding protocol that has been distributed to a number of interested institutions.

Recovery Plan Status: Plan approved 9/27/91.

Massachusetts

Piping Plover

(*Charadrius melodus*)—Threatened

Current Status: Throughout the piping plover's Atlantic Coast range, persistent threats include loss or alteration of beach nesting habitat from development and coastal stabilization activities, predation, and disturbance by beach recreationists and their pets.

Achievements: The Massachusetts piping plover population has increased by more than 50 percent during the last 2 years, from 139 pairs in 1990 to 213 pairs in 1992. Statewide, productivity in 1992 was a record 2.02 fledged chicks per nesting pair. These gains resulted primarily from intensive protection efforts, including deployment of predator exclosure devices, imposing restrictions on off-road vehicles near breeding sites, and implementation of a variety of measures to reduce disturbance from beach activities. Informal section 7 consultations with the National Park Service (Cape Cod National Seashore) and the Army Corps of Engineers have resulted in measures to enhance the protection of plover habitat in Massachusetts.

Current Recovery Needs: Current recovery efforts, including use of predator exclosures and management of nesting habitat, need to continue.

James P Mattison

Section 6 Funding and Activities: The Massachusetts Division of Fisheries and Wildlife received $8,000 in both FY 1991 and FY 1992 for piping plover management and protection.

Partnerships

National Park Service: This Federal agency has a comprehensive and highly effective program to protect piping plover nesting habitat on Cape Cod National Seashore.

Massachusetts Division of Fisheries and Wildlife: This State agency coordinates a network of cooperators, including a number of municipalities and the University of Massachusetts, that provide monitoring and management on virtually all 55 piping plover nesting sites in the State.

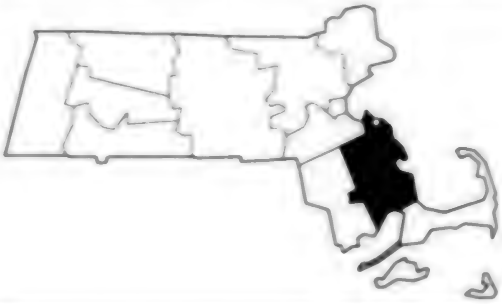
The Trustees of Reservations, Massachusetts Audubon Society, The Lloyd Center for Environmental Studies, and Sheriff's Meadow Foundation: These private organizations monitor nesting areas, deploy predator exclosures, fence and sign nesting areas, and provide public information on specific beaches.

Recovery Plan Status: Plan approved 3/31/88.

Massachusetts

Plymouth Red-bellied Turtle

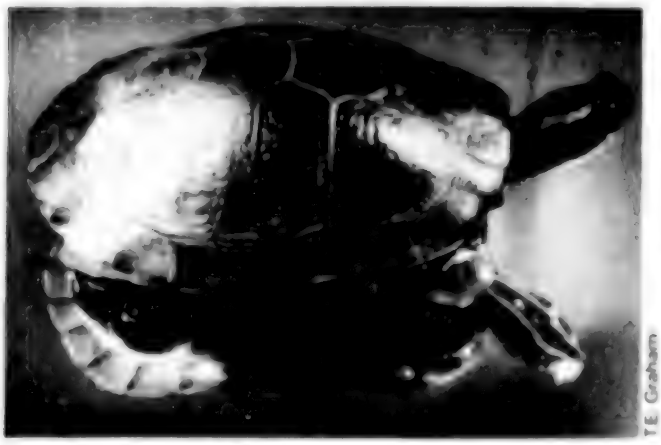
(*Pseudemys rubriventris bangsi*)—Endangered



Current Status: The very limited range of the Plymouth red-bellied turtle is foremost among the threats to its survival and recovery: all inhabited ponds are confined to a small section of Plymouth County. Development of upland habitats, surrounding ponds, and shorelines adversely affects the turtle through the loss of nesting and basking sites, increased predation of eggs by raccoons and skunks, fluctuations in water table levels, and increased incidental mortality from vehicular traffic, shooting, and pets.

Achievements: Recovery efforts focus on locating nests, protecting nest sites from predation, and retaining a number of hatchlings for "headstarting" in captivity. Headstarting provides young turtles with improved growth and survival potential. After 9 months in captivity, well-fed young turtles are returned in the spring to their natal ponds or historic habitat.

After surveying Federal Pond in 1991, biologists located a record 50 nests that produced 430 hatchlings. Biologists released more than 300 of these young turtles directly into the pond and retained 110 for headstarting. The survival rate for hatchlings in captivity exceeded 97 percent, much greater than in the wild, and the robust headstarted turtles were released into six ponds in the spring of 1992. In addition to the success of the headstarting program, recent monitoring efforts have identified a significant number of young turtles that are the result of natural recruitment, an encouraging sign.



T.E. Graham

Current Recovery Needs: Necessary recovery actions include monitoring occupied ponds, surveying historic habitat, examining limiting factors, expanding the headstarting and nest-protection programs, identifying and protecting essential habitats, improving habitat through management, and continuing public education efforts.

Section 6 Funding and Activities: In both FY 1991 and FY 1992, the Massachusetts Division of Fisheries and Wildlife received $5,000 to support nest protection and monitoring. These funds also support tracking the survival of released turtles in the wild.

Partnerships

Massachusetts Division of Fisheries and Wildlife, Worcester State College, and University of Massachusetts: The Massachusetts Division of Fisheries and Wildlife (Natural Heritage and Endangered Species Program) monitors population status and trends, searches for new occurrences, evaluates limiting factors, manages the Massasoit National Wildlife Refuge under a cooperative agreement with the Fish and Wildlife Service, locates and protects nests, coordinates the headstarting program, reestablishes new populations, enforces State endangered species protection regulations, and conducts public information and education programs. Several of these tasks have been conducted in conjunction with researchers at the Worcester State College (Department of Natural and Earth Sciences) and University of Massachusetts (Department of Forestry and Wildlife Management). In addition, the Massachusetts Division of Fisheries and Wildlife has headstarted and released more than 165 turtles into 10 ponds, including 4 new sites in the past 2 years.

Recovery Plan Status: Original plan approved 3/26/81; revised 9/25/85.

Massachusetts

Roseate Tern

(*Sterna dougallii dougallii*)—Endangered

Current Status: Since its listing in 1987, the nesting population of roseate terns on the northeast coast had increased slightly to more than 3,000 pairs, but then declined by nearly 700 pairs in 1992 due to unknown causes. Disease, pollution, storms, or predation could inflict irreparable damage on the population, 90 percent of which nests at only two colonies. Competition for nesting space with an expanding population of gulls has forced roseate terns to nest in concentrated colonies or attempt to nest on unsuitable islands. Unidentified mortality factors away from the nesting grounds, presumably in wintering areas along the northern coast of South America, are exceptionally high and offset the reproductive success at managed nesting colonies. About half of the birds nest in Massachusetts, most on a single small island in Buzzards Bay.

Achievements: Selected islands are being restored as tern breeding grounds, in part by controlling the gulls that prey on tern eggs and compete with roseate terns for nesting space. In addition, structures such as open-sided nesting boxes have been used to increase fledging success where predatory birds are a problem. Signs and fencing have been used to deter human disturbance at nesting sites.

Current Recovery Needs: In Massachusetts, the top recovery priorities are to reestablish a second colony in Buzzards Bay and rebuild productive colonies on lower Cape Cod. Monitoring nesting sites and long-term research on population dynamics must continue. A well-planned survey to locate wintering grounds, followed by evaluation of mortality factors, is essential.

Section 6 Funding and Activities: The Massachusetts Division of Fisheries and Wildlife received $12,000 in both FY 1991 and FY 1992 for the gull removal program.

Bud Oliveira

Partnerships

Massachusetts Division of Fisheries and Wildlife: The agency is continuing to remove gulls and monitor their populations.

Massachusetts Audubon Society and Manomet Bird Observatory: These organizations are researching roseate tern productivity, mortality factors, and feeding ecology.

Recovery Plan Status: Plan approved 3/20/89.

Michigan

Species Name	*Status*
Bat, Indiana	E
Wolf, gray	E
Eagle, bald	T
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	E
Warbler (wood), Kirtland's	E
Butterfly, Mitchell's satyr	E
Chaffseed, American	E
Fern, American hart's-tongue	T
Goldenrod, Houghton's	T
Iris, dwarf lake	T
Monkey-flower, Michigan	E
Orchid, eastern prairie fringed	T
Pogonia, small whorled	E
Thistle, Pitcher's	T

Michigan

Gray Wolf

(*Canis lupus*)—Endangered

Current Status: The Michigan wolf population is growing steadily. Its primary threat is persecution resulting from negative public opinion.

Achievements: In 1992, the Michigan Department of Natural Resources appointed a State wolf recovery team. Wolves have immigrated naturally into Michigan's Upper Peninsula from Wisconsin and Ontario. The first documented natural reproduction of wolves in Michigan (other than on Isle Royale) in 40 years occurred in 1991.

Current Recovery Needs: A State recovery and management plan is needed. Increased protection for gray wolves, along with public involvement, public education, and a procedure for controlling the loss of domestic animals and providing compensation to their owners will be important components of the recovery process.

Ronald L. Bell

Section 6 Funding and Activities: In FY 1991, the Fish and Wildlife Service provided $18,000 to the Michigan Department of Natural Resources for wolf monitoring activities.

Partnerships

National Park Service: This Federal agency has a history of success in managing wolves and habitat on Isle Royale. Intensive research on wolf ecology has been a part of this history. A recently completed fire management plan allows natural fires to run their course in accordance with the Eastern Timber Wolf Recovery Plan.

Michigan Department of Natural Resources: The Department heads a State wolf recovery team. Public education and involvement are key components. A cooperative Wisconsin-Michigan wolf monitoring study partially funded by the Fish and Wildlife Service is under way in the Upper Peninsula.

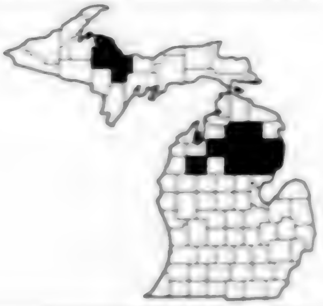
The Timber Wolf Alliance: A nonprofit organization that is promoting wolf recovery in the Great Lakes region, this group has supported the Wisconsin recovery program and is likely to do so in Michigan.

Recovery Plan Status: Original plan approved 6/5/78; revised 1/31/92.

Michigan

Kirtland's Warbler

(*Dendroica kirtlandii*)—Endangered



Current Status: During the nesting season, the Kirtland's warbler is a habitat specialist that is restricted to extensive areas dominated by 5- to 6-year-old jack pines (1 to 5 feet tall). Such areas are created when fires occur in mature stands of jack pines, resulting in seed germination. During modern times, forest fire control has reduced the total acreage burned and also the size of individual burns. As a result, nesting habitat shortages remain the principal threat to the warbler, since natural regeneration of habitat is precluded by forest fire control. Weather conditions may complicate habitat management; for example, droughts can result in the loss of jack pine nursery stock. However, cowbird nest parasitism is manageable and should remain that way with the continuation of the control program.

Achievements: The Fish and Wildlife Service and the Michigan Department of Natural Resources completed a cooperative agreement for the management of Service land in 1992, the same year the Kirtland's warbler count totalled 397 male birds. This was an increase of 14 percent over the previous year, and the highest number since 1961. During the last 13 years, the Service has acquired nearly 7,000 acres for inclusion in Kirtland's Warbler Management Units. Continued monitoring of cowbird nest parasitism resulted in the removal of more than 3,700 cowbirds from warbler breeding colonies in 1992. The Service's Patuxent Wildlife Research Center concluded field work on a study of site fidelity and related topics in 1992. Preliminary results of the Patuxent study indicate the survival rates of young and adult Kirtland's warblers are comparable to those of other wood warblers and are adequate for survival. Field work also was concluded in 1992 on an Ohio Cooperative Research Unit doctoral examination of habitat variables and their effects on mating and reproduction. In informal section 7 activities, the Forest Service consulted on its cooperative gypsy moth spraying program. A one-half mile no-spray buffer zone around active Kirtland's warbler nesting areas resulted.

Current Recovery Needs: Continued habitat management, population monitoring, cowbird control, and public outreach efforts are required for recovery.

Michigan Department of Natural Resources

Section 6 Funding and Activities: The Michigan Department of Natural Resources received $180,663 in FY 1991 and $175,000 in FY 1992 for protection, monitoring, planning, and habitat management on State Forest Kirtland's Warbler Management Units.

Partnerships

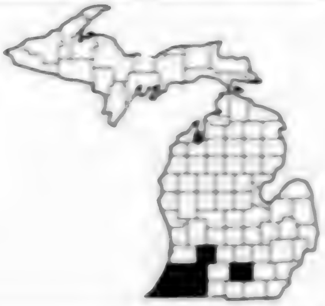
Forest Service: Responsible for Huron National Forest Kirtland's Warbler Management Units, the Forest Service did not meet all of its 1992 habitat management goals due to drought-related loss of jack pine nursery stock. However, the agency continues to finance the hand-planting of jack pine seedlings to augment tree densities. Approximately 2,000 acres of habitat were created by the Forest Service and the Michigan Department of Natural Resources in 1992 as a result.

Michigan Department of Natural Resources: The Department was active in monitoring birds and managing habitat on State lands.

Michigan Audubon Society: Under a cooperative agreement with the Fish and Wildlife Service, the Audubon Society annually provides $1,500 to augment the budget for guided public viewings of Kirtland's warblers. Additional public education cost share was provided to the Forest Service

Recovery Plan Status: Original plan approved 10/22/76; revised 9/30/85.

Michigan

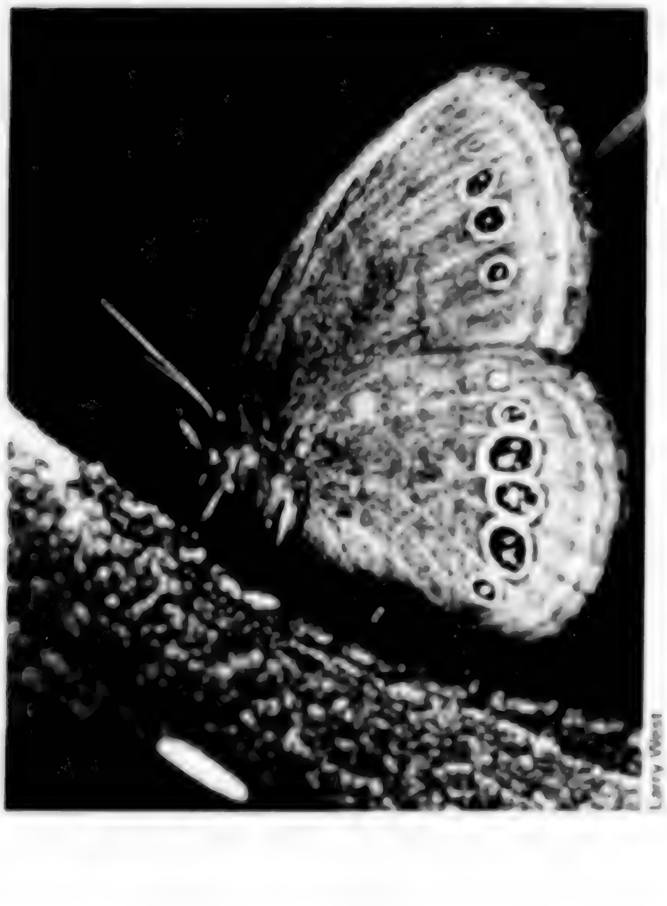


Mitchell's Satyr Butterfly

(*Neonympha mitchellii mitchellii*)—Endangered

Current Status: The Mitchell's satyr butterfly occurs in fens, an unusual wetland type characterized by calcareous soils fed by carbonate-rich water from seeps and springs. Draining these areas or converting them to agricultural and urban uses has depleted habitat supporting the butterfly. Its rarity and dramatic markings also make it prized by collectors, and thus vulnerable to overcollection.

Achievements: This species gained Endangered Species Act protection with the publication of a final listing rule on May 20, 1992. A recovery outline was completed in July, and a recovery team was appointed in September. Fish and Wildlife Service law enforcement personnel patrolled sites frequented by the butterfly during the 1991 flight season, and increased those patrols in 1992 to eliminate illegal collecting. In addition, an informal section 7 consultation began with the Federal Highway Administration. Under discussion is a U.S. Highway 31 project in Berrien County that may cross important Mitchell's satyr habitat. The site was surveyed intensively by Michigan Department of Transportation contractors to determine the species' micro-habitat needs. Data from those studies are being analyzed. In addition, Habitat Conservation Plans are being developed in conjunction with private landowners whose properties contain butterfly habitat.



Larry West

Current Recovery Needs: Development and implementation of a recovery plan is a critical need for this species, as is the acquisition and management of Mitchell's satyr habitat. Recovery needs include protection from collectors and vandals, pollution prevention, population monitoring, and stabilization of the water system sustaining the species' habitat.

Partnerships

The Nature Conservancy: The Conservancy's private landowner registration program encourages owners to manage land for the benefit of rare habitats and the species inhabiting them. This includes calcareous fens supporting Mitchell's satyr populations. The Conservancy also has acquired Mitchell's satyr habitat. It monitors the species at these and other locales. A mark-recapture study was conducted in 1992 to determine population numbers.

Recovery Plan Status: Plan under development.

Michigan

Pitcher's Thistle

(*Cirsium pitcheri*)—Threatened

Current Status: This wooly-leafed plant with flowers ranging from cream to yellow grows along the sandy shores of the Great Lakes, primarily on stabilized, well developed dunes. The vulnerability of its habitat to development and recreational activities makes the thistle increasingly susceptible to population fragmentation.

Achievements: The recent discovery of two new populations has added to the known numbers of this dune-loving plant. Further protection has been provided under section 7 consultations with Sleeping Bear Dunes National Lakeshore (1991 formal consultation); the Army Corps of Engineers (two formal 1992 consultations for Clean Water Act section 404 permits concerning coastal development for marinas, condominiums, and driveways); and the Rural Electrification Agency (a 1991 informal consultation for a City of Manistee section 404 permit concerning transmission line projects). A Habitat Conservation Plan is also under consideration for Charity Island, where the Army Corps of Engineers recently permitted a marina and residential complex.

Current Recovery Needs: Finalization of the draft recovery plan, habitat protection, surveys, and monitoring are needed.

Partnerships

National Park Service: A 2-year study of long-term monitoring plots has been completed, and a management workshop convened by Sleeping Bear Dunes National Lakeshore was held in 1992.

Michigan Department of Natural Resources: The Department contributes to Recovery Team activities, as well as thistle surveys and management. A landowner contact program is ongoing. The Department completed a state recovery plan, which steps down the federal plan, in 1992.

FWS File Photo

The Nature Conservancy: The Conservancy's private landowner registration program encourages owners to manage land for the benefit of rare habitats and the species inhabiting them.

Recovery Plan Status: Technical/Agency draft plan.

Minnesota

Species Name	*Status*
Wolf, gray	T
Eagle, bald	T
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	E
Mussel, winged mapleleaf	E
Pearly mussel, Higgins' eye	E
Bush-clover, prairie	T
Lily, Minnesota trout	E
Orchid, western prairie fringed	T
Roseroot, Leedy's	T

Bald Eagle

(*Haliaeetus leucocephalus*)—Threatened

Current Status: In 1991, at least 437 bald eagle nesting territories produced an estimated 1.0 young per occupied territory. However, piecemeal development of nesting, feeding, migrating, roosting, and wintering habitat statewide still threatens the eagle, as do contaminants and human disturbance.

Achievements: Several Federal agencies are involved in recovery efforts for the bald eagle in Minnesota, as is the Minnesota Department of Natural Resources. With the participation of these agencies, annual inventories of breeding areas are conducted, habitat uses are determined, nestlings are banded, breeding habitat is assessed, public education is provided, powerline problems are resolved, nesting and potential habitat management plans are developed, and winter habitat management plans are developed.

Current Recovery Needs: Protection for eagle breeding, feeding, migration, and wintering habitat is needed in Minnesota. The Fish and Wildlife Service has concentrated habitat protection on nesting sites, but other habitats are being lost to development, and strategies to protect all habitats need to be formulated. Additionally, the recovery plan needs updating, with particular attention to providing criteria for habitat protection and other factors in maintaining target eagle numbers.

Partnerships

Forest Service, National Park Service, Bureau of Land Management, Army Corps of Engineers, and Environmental Protection Agency: These Federal agencies work cooperatively to conduct annual inventories of breeding areas, determine distribution of breeding areas, analyze data, conduct winter surveys, determine habitat use, band nestlings, assess various habitats, conduct public education, resolve powerline problems, develop habitat management plans, develop winter area management plans, conduct tours, and prepare magazine articles about the status of the eagle.

Paul W. Sykes, Jr.

Minnesota Department of Natural Resources: This State agency has been involved in protecting nesting habitat and developing summer and winter plans, as well as working with Federal agencies in carrying out their recovery tasks.

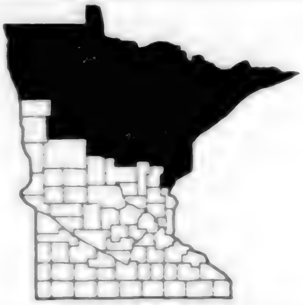
Minnesota Taconite Mining Company: This private company worked with the Fish and Wildlife Service to save a faltering nest structure and protect a newly established breeding area near the settling ponds at MinnTac mine in Mt. Iron, Minnesota. A new nest was constructed by MinnTac within the breeding area using native materials in a tree located in a protected area on mine property.

Recovery Plan Status: Plan approved 7/29/83.

Minnesota

Gray Wolf

(Canis lupus)—Threatened



Current Status: A stable population estimated at as many as 1,750 gray wolves currently exists in Minnesota. Threats include human persecution, habitat destruction and modification, road construction, and possibly diseases and prey base declines.

Achievements: At present, wolf experts believe there is enough suitable habitat in Minnesota to permit recovery. Additionally, Federal and State agencies are working to revise practices for roadside revegetation in white-tailed deer habitat. Converting to warm-season, native prairie plants should reduce the number of deer attracted to roadsides for forage and thus reduce the number of wolves killed while pursuing deer across roads. A formal section 7 consultation with the National Park Service on a wilderness recommendation for Voyageurs National Park resulted in a no-jeopardy biological opinion.

Current Recovery Needs: Maintaining large tracts of habitat with low human density and adequate wild prey will be needed for the species to recover. Major actions include monitoring wolf populations, habitat conditions, and prey base; enforcing protective laws; minimizing predation on domestic animals; and educating the public.

Partnerships

Forest Service: In monitoring the gray wolf population, the Forest Service is developing information about the species' survival, mortality, productivity, and prey. The agency is also promoting public education.

National Park Service: This Federal agency is working to manage large tracts of habitat, protect existing populations with the goal of restoring at least 100 wolves to Wisconsin and Michigan (outside Isle Royale), and create a coordination committee of State and Federal representatives to implement the Eastern Timber Wolf Recovery Plan.

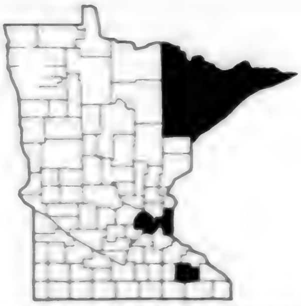
Department of Agriculture, Animal Damage Control: This agency is responsible for monitoring diseases and parasites in wolves and minimizing domestic livestock losses from predation.

Minnesota Department of Natural Resources: With the Minnesota Department of Agriculture, Michigan Department of Natural Resources, and Wisconsin Department of Natural Resources, this agency is undertaking a range of activities including, maintaining prey populations by habitat management, managing the harvest of prey species to ensure a surplus for the gray wolf, providing concerted law enforcement, and generating public support for reestablishing the wolf.

Recovery Plan Status: Original plan approved 6/5/78; revised 1/31/92.

L. David Mech

Minnesota



Peregrine Falcon

(*Falco peregrinus*)—Endangered

Current Status: The peregrine falcon breeding population continues to increase in Minnesota. However, peregrines in Minnesota continue to be threatened by collisions with man-made structures and automobiles, great horned owl predation, human disturbance, loss of potential nesting areas, and, possibly, contaminants.

Achievements: The Fish and Wildlife Service is working with the University of Minnesota's Raptor Center and the Minnesota Department of Natural Resources to establish and monitor six nesting sites within the metro Twin Cities area, and to monitor two natural nest sites along the north shore of Lake Superior. The Service is also working with a landowner and The Nature Conservancy to protect the Little Marais nest site from disturbance and adjacent proposed development. The Raptor Center, Minnesota Falconers Association, private corporations, groups, and individuals actively collaborate to aid peregrine falcon recovery in Minnesota.

Current Recovery Needs: The species may be approaching its nesting habitat carrying capacity in Minnesota, but hacking should continue for the present.

FWS File Photo

Partnerships

Forest Service, National Park Service, and Department of Defense: These Federal agencies have responsibilities for monitoring peregrines in Minnesota and protecting nesting sites. These responsibilities are set out in the 1991 update of the Eastern Peregrine Falcon Recovery Plan.

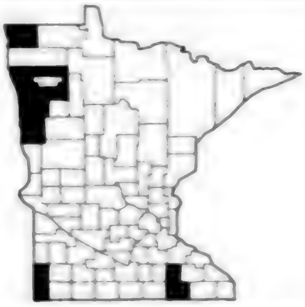
Environmental Protection Agency and U.S. Department of State: The Environmental Protection Agency is responsible for regulating the use of pesticides that affect peregrines, and the State Department discourages foreign use of pesticides that affect peregrines.

Minnesota Department of Natural Resources: This State agency protects and manages nesting, migration, and wintering habitats; conducts releases of peregrines to the wild; monitors nesting populations; bands young falcons; monitors migrating and wintering peregrines; provides law enforcement protection; and conducts public education.

The Raptor Center at the University of Minnesota, St. Paul Campus: The Raptor Center coordinates the peregrine reintroduction program for Minnesota and other midwestern States, and rehabilitates sick and injured falcons.

Recovery Plan Status: Original plan approved 8/20/79; revised 9/27/91.

Minnesota



Western Prairie Fringed Orchid

(*Platanthera praeclara*)—Threatened

Marlin Bowles

Current Status: This perennial herb with its showy clusters of white blossoms is largely threatened by loss of remnant prairie, mainly through conversion to cropland, and the use of herbicides and insecticides (which could eliminate pollinators).

Achievements: Site protection through voluntary landowner agreements and other State efforts to protect and restore orchid habitat on State and private land have helped stabilize the species. Though not mentioned in the draft recovery plan (now under review), the Minnesota Department of Agriculture has played an important role through its landowner contact program. This Environmental Protection Agency-funded program, developed in cooperation with the Minnesota Department of Natural Resources and the Fish and Wildlife Service, allows private landowners voluntarily to agree to pesticide use practices that will protect listed plants on their land. When enough sites in a county have been covered by agreements, the county avoids a possible section 7 jeopardy opinion for a particular pesticide.

Current Recovery Needs: Habitat protection and appropriate guidelines for herbicide and insecticide use are needed.

Section 6 Funding and Activities: The Minnesota Department of Natural Resources received $3,096 in FY 1991 and $5,359 in FY 1992 for population monitoring.

Partnerships

Minnesota Department of Natural Resources: Responsibilities carried out by this State agency involve monitoring known populations, surveying suitable habitat, assisting in the landowner contact program, and conducting public education activities.

Minnesota Department of Agriculture: The landowner contact program is an ongoing effort being carried out by this State agency.

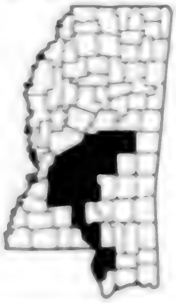
Recovery Plan Status: Technical draft plan.

Mississippi

Species Name	*Status*
Bat, Indiana	E
Bear, Louisiana black	T
Manatee, West Indian (=Florida)	E
Crane, Mississippi sandhill	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Pelican, brown	E
Plover, piping	T
Tern, least (interior population)	E
Woodpecker, red-cockaded	E
Snake, eastern indigo	T
Tortoise, gopher	T
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, Kemp's (=Atlantic) ridley sea	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Turtle, ringed sawback	T
Turtle, yellow-blotched map (=sawback)	T
Darter, bayou	T
Sturgeon, Gulf	T
Sturgeon, pallid	E
Heelsplitter, inflated	T
Mussel, Curtus'	E
Mussel, Judge Tait's	E
Mussel, Marshall's	E
Mussel, penitent	E
Stirrup shell	E
Pondberry	E
Potato-bean, Price's	T

Ringed Sawback Turtle

(*Graptemys oculifera*)—Threatened



FWS File Photo

Current Status: The ringed sawback turtle remains vulnerable to habitat modification by flood control activities and commercial collecting. Additionally, there is evidence of adverse impacts on water quality below Ross Barnett Reservoir, likely from non-point sources in the city of Jackson. Construction of a reservoir in the upper Pearl River near Edinburg is under consideration by the Bureau of Indian Affairs and would likely have a negative impact on the ringed sawback turtle.

Achievements: The turtle's population in five river stretches has been estimated by the Mississippi Department of Wildlife, Fisheries, and Parks using a mark and recapture study conducted over a 3-year period. The population was estimated to range from 800 to fewer than 60 individuals per kilometer, depending upon the particular river stretch. Information on sex ratios, growth rates, and age at maturity was also gathered by Mississippi Department of Wildlife, Fisheries, and Parks.

Current Recovery Needs: Continued population monitoring will be needed, as well as life-history research. Protection of river stretches containing ringed sawback turtle populations is needed.

Partnerships

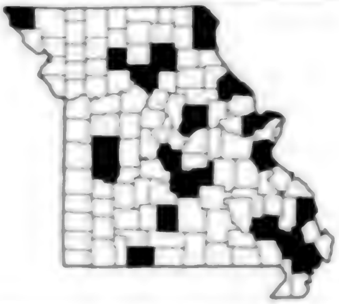
Mississippi Department of Wildlife, Fisheries, and Parks: This State agency has taken the lead in estimating population levels of the ringed sawback turtle, as well as gathering biological information on the species.

Recovery Plan Status: Plan approved 4/8/88.

Missouri

Species Name	*Status*
Bat, gray	E
Bat, Indiana	E
Bat, Ozark big-eared	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, least (interior population)	E
Cavefish, Ozark	T
Darter, Niangua	T
Madtom, Neosho	T
Sturgeon, pallid	E
Pearly mussel, Curtis'	E
Pearly mussel, Higgins' eye	E
Pearly mussel, pink mucket	E
Pocketbook, fat	E
Aster, decurrent false	T
Bladderpod, Missouri	E
Geocarpon minimum (=Sci. name)	T
Milkweed, Mead's	T
Orchid, western prairie fringed	T
Pondberry	E

Missouri



Bald Eagle

(*Haliaeetus leucocephalus*)—Endangered

Current Status: The number of birds observed during the annual winter count has increased over the last 2 years, and the number of nesting birds in the State continues to grow. During the most recent nesting season, 10 active nests with 21 fledglings were documented. However, eagles continue to be shot in the State, and one eagle was poisoned by the pesticide Carbofuran.

Achievements: Several interagency partnerships and cooperative agreements or projects are expected to provide significant benefits to the bald eagle in Missouri. These include the Missouri River Mitigation program (see Partnerships below); a partnership called Missouri River—Conserving a River Ecosystem; and the Missouri River Natural Resources Committee, a State-sponsored cooperative. Additionally, land acquisitions, easements, and landowner agreements associated with the development of a new fish and wildlife refuge in Missouri should help protect habitat essential to the eagle. The proposed New Madrid National Wildlife Refuge will contribute to the objectives of the North American Waterfowl Management Plan's Lower Mississippi Valley Joint Venture, providing important habitat to both nesting and wintering bald eagles.

FWS File Photo

Current Recovery Needs: Additional education programs need to be initiated to stop the illegal shooting of bald eagles in Missouri.

Partnerships

Missouri River Mitigation: This program is a cooperative agreement among the Army Corps of Engineers and the States of Missouri, Iowa, Kansas, and Nebraska to secure mitigation for lost natural resource values on the Missouri River below Sioux City, Iowa.

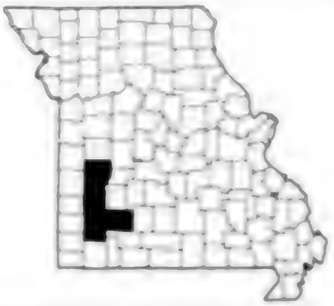
Missouri Department of Conservation: This State agency monitors nest sites and conducts annual winter bird counts. Additionally, the Missouri River Natural Resources Committee, mentioned above, is involved in coordinating Missouri River activities of interest to the Missouri River Basin's 10 State fish and wildlife conservation agencies.

World Bird Sanctuary of St. Louis, Missouri: This private organization is continuing a bald eagle hacking project in St. Louis, Missouri.

Recovery Plan Status: Plan approved 7/29/83.

Missouri

Geocarpon minimum—Threatened



Current Status: This tiny plant was listed in 1987 as threatened because of its limited distribution and habitat destruction or modification from pasturing, off-road vehicle use, forestry practices, and succession. However, its status in Missouri now appears to be secure, and the species may be recovered within the next decade. Overgrazing currently is the primary threat to this plant, and it may be detrimental only to certain populations.

Achievements: Schwartz's Prairie in St. Clair County was acquired by the Missouri Prairie Foundation, a non-profit citizens group, to protect a geocarpon site. The Fish and Wildlife Service, Missouri Prairie Foundation, and Missouri Department of Conservation also secured a Service Challenge Grant to develop a geocarpon management plan on Missouri Prairie Foundation lands.

Current Recovery Needs: Among the needs listed in the draft recovery plan are protecting viable populations throughout the species' range, searching potential habitat for additional populations, continuing to monitor known sites, establishing experimental populations, and determining the effects of disturbance.

Partnerships

Army Corps of Engineers: The Corps is working with the Missouri Department of Conservation to manage the Bona Glade at Stockton Reservoir.

Missouri Department of Conservation: The Department is working with the Missouri Prairie Foundation to develop a management plan for Schwartz's Prairie. In addition, the Department received $13,000 from the Fish and Wildlife Service to acquire an additional geocarpon site.

Sherry Morgan

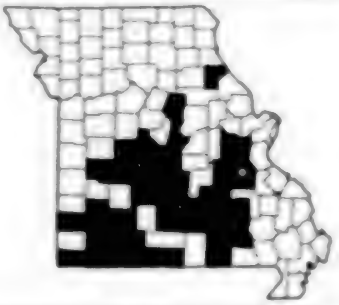
The Nature Conservancy: The Conservancy has registered and manages four sites. Registry is a non-binding, non-regulatory program that recognizes landowners who have voluntarily agreed to protect natural features on their lands.

Missouri Prairie Foundation: The Foundation is developing a management plan for its recent prairie acquisition, which will include provisions for protecting geocarpon.

Recovery Plan Status: Agency draft plan.

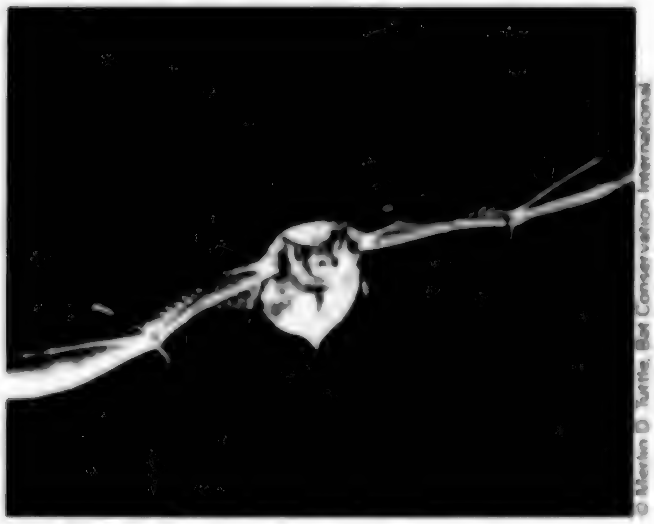
Gray Bat

(*Myotis grisescens*)—Endangered



Current Status: This mammal continues to increase throughout its range. Although there are apparently few current threats, the use of forestry insecticides and crop pesticides in areas adjacent to riparian corridors where gray bats forage may reduce the prey base or kill bats that ingest contaminated insects. Some maternity and hibernating colonies are susceptible to human disturbance.

Achievements: Gray bats have increased because of better protection measures such as gates, fences, and signs around caves; better cave gate designs to restrict human disturbance; and improved public education programs. In addition, biologists in Missouri have discovered three new caves with gray bat populations. As a member of the National Pesticide Consultation Team, the Fish and Wildlife Service contributed recommendations pursuant to a biological opinion that evaluated the effects of 31 pesticides on all listed species. The Service issued a few no-jeopardy biological opinions on probable impacts of some chemicals on the gray bat, identifying buffer zones or time restrictions on applying pesticides as reasonable and prudent measures to minimize incidental take.



© Merlin D. Tuttle, Bat Conservation International

Current Recovery Needs: While many sites are adequately protected, additional protection is needed in areas where human disturbance is a problem. Gray bats are reappearing in caves they used historically on an infrequent basis and labelled in the Recovery Plan as "low priority" sites. To assess the recovery of the species, such sites should be monitored regularly.

Partnerships

National Park Service: This Federal agency restricts human access to six gray bat maternity caves on its lands and monitors them for possible disturbance.

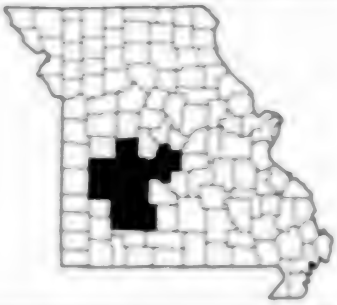
Missouri Department of Conservation: The Department recently purchased a gray bat maternity cave in Stone County, and is revising a plan for protected bat species in Department-owned caves. The Department has also developed site specific management plans for some caves on private property.

The Nature Conservancy: To protect habitat, the Conservancy has established six voluntary protection agreements with private landowners for gray bat maternity sites.

Recovery Plan Status: Plan approved 7/8/82.

Niangua Darter

(*Etheostoma nianguae*)—Threatened



Current Status: Gravel dredging, bank erosion, and the construction of low water crossings threaten this fish by altering its habitat. Degraded water quality due to discharge of organic wastes may be an additional threat.

Achievements: The Missouri Department of Conservation has protected a section of stream habitat occupied by the Niangua darter and is working with landowners to stabilize eroding stream banks. As a member of the National Pesticide Consultation Team, the Fish and Wildlife Service contributed recommendations pursuant to a biological opinion that evaluated the effects of 31 pesticides on all listed species. The Service issued a few no-jeopardy biological opinions for probable impacts of some of the chemicals on the Niangua darter. Buffer zones were recommended as reasonable and prudent measures to minimize incidental take.

W.L. Pflieger, Missouri Department of Conservation

Current Recovery Needs: Recovery needs include monitoring the abundance and distribution of the Niangua darter throughout its range; improving coordination efforts among Federal, State, municipal, and private entities to prevent habitat alteration within designated critical habitat; expanding partnerships with landowners through cooperative agreements; and researching the effects of substrate destabilization, increased sedimentation, removal of woody vegetation from stream banks, and higher levels of organic wastes on the reproduction of Niangua darters.

Partnerships

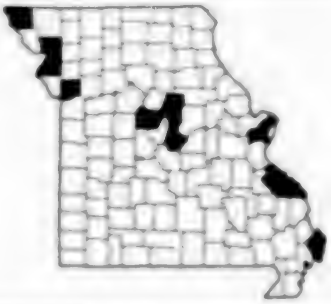
Missouri Department of Conservation: The Department is actively involved in protecting habitat and increasing public awareness about the plight of the Niangua darter. The Fish and Wildlife Service and the Department established a cooperative agreement to facilitate recovery efforts for the species, using a challenge grant to fund a public outreach program to protect and restore habitat on private lands. The Department is developing a Niangua darter videotape that will be an important outreach tool.

Recovery Plan Status: Plan approved 7/17/89.

Missouri

Pallid Sturgeon

(*Scaphirhynchus albus*)—Endangered



Current Status: Dam construction has altered spawning habitat, impeded the species' movements, reduced preferred food, and altered water temperatures and other environmental conditions necessary for survival. Overfishing, pollution, and hybridization are possible further reasons for the species' decline.

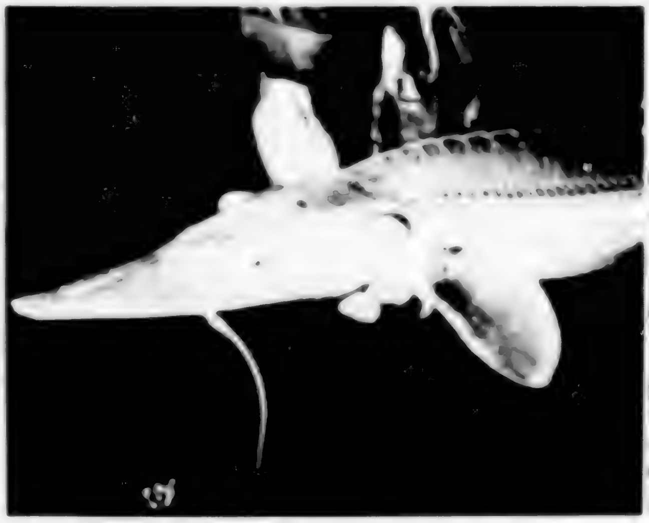
Achievements: An informal section 7 consultation is taking place with the Army Corps of Engineers' Kansas State District regarding the potential adverse impacts of sand and gravel dredging in the Missouri River. Also, a draft recovery plan has been released for public review, and the Fish and Wildlife Service is working with several groups to develop and evaluate Missouri River water management alternatives as part of the Missouri River Master Manual review. The Service recommended changes in management of the river's flow regime to benefit the sturgeon. A cooperative pilot project with the National Fisheries Contaminant Research Center (Columbia, Missouri) is expected to determine fish contaminant sources. Land acquisitions, easements, and landowner agreements associated with the development of a new fish and wildlife refuge in Missouri also should help protect habitat essential to the sturgeon.

Current Recovery Needs: Protection of populations and habitat; implementation of an artificial propagation program; development of a nationwide program to implement recovery; research on sturgeon movements, habitat and food preferences, spawning requirements, and genetic variability; and evaluation of impacts of commercial and industrial operations are needed.

Partnerships

Army Corps of Engineers: Under a cooperative agreement with Missouri, Iowa, Kansas, and Nebraska, the Corps is attempting to mitigate lost natural resource values on the Missouri River below Sioux City, Iowa.

Missouri Department of Conservation: Personnel succeeded in spawning pallid sturgeon at the Department's Blind Pony State Hatchery, and are now maintaining 20,000 fingerlings until completion of genetic studies by Genetic Analyses, Inc.



Jim Rathert, Missouri Department of Conservation

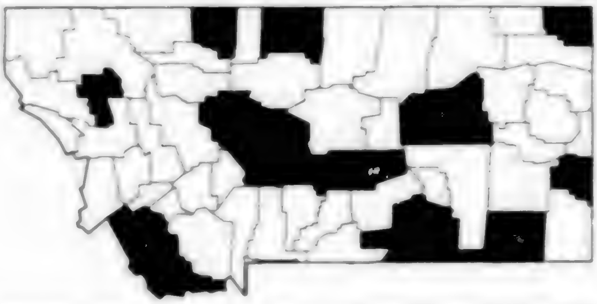
Missouri River Natural Resources Committee: This State-sponsored cooperative helps coordinate activities of interest to the Missouri River Basin's 10 State wildlife agencies.

Mississippi Interstate Cooperative Resource Agreement: This interagency and interstate partnership helps promote conservation of fishery resources within the Mississippi River Basin.

Recovery Plan Status: Agency draft plan.

Montana

Species Name	*Status*
Bear, brown (=grizzly)	T
Ferret, black-footed	E
Wolf, gray	E
Crane, whooping	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, least (interior population)	E
Sturgeon, pallid	E



American Peregrine Falcon

(*Falco peregrinus anatum*)—Endangered

Current Status: Wetland and riparian habitat loss is one of the primary threats to this species, along with the use of organochlorine pesticides in Mexico and South America (the peregrine's wintering grounds). Shooting, egg collecting, and interference with nesting likewise have been documented.

Achievements: Extirpated from Montana by 1982, peregrines were reintroduced from captive-bred stock. Seventy-three peregrines have been released in Montana since 1981, with approximately 81 percent reaching independence. Montana now has 10 wild breeding pairs. Equally encouraging are recent sightings of single adults at cliffs where they have not been detected in years. The Forest Service, Bureau of Land Management, National Park Service, and Federal Highway Administration, consulting on Federal projects under section 7, have worked out all conflicts informally with only slight modifications to projects.

FWS File Photo

Montana also has an active interagency peregrine falcon working group composed of representatives from State and Federal agencies, universities, conservation groups, and private industry.

Current Recovery Needs: Continuing releases of captive-bred peregrines, as well as monitoring of contaminants and peregrine populations, are needed.

Partnerships

Bureau of Land Management, Forest Service, and National Park Service: These Federal agencies help monitor wild nest sites, inventory habitat, and provide funding for the reintroduction program.

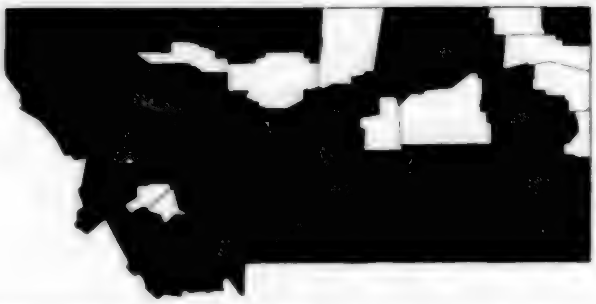
Montana Department of Fish, Wildlife, and Parks: The Department helps coordinate all phases of falcon recovery, provides technical assistance at reintroduction sites, and assists with monitoring population status.

Confederated Salish and Kootenai Tribes: The tribes are funding a reintroduction site and are assisting with surveys and inventories.

The Peregrine Fund: The Peregrine Fund has provided offspring of captive falcons for release in the wild, as well as coordination and expertise at release sites, assistance with surveys and monitoring, and advice on overall recovery strategies.

Recovery Plan Status: Original plan approved 8/3/77; revised 12/14/84.

Montana



Bald Eagle

(Haliaeetus leucocephalus)—Endangered

Current Status: Since surveys began in 1978, Montana's bald eagle population has grown consistently, both in total number of pairs and number of young fledged. Threats to recovery include habitat loss from logging and development, loss of wetland and riparian habitat, water pollution, nesting failure caused by human disturbance at active nest sites, lead poisoning, the use of certain insect and predator poisons, and electrocution from powerlines.

Achievements: The number of bald eagle nesting territories in Montana grew from 25 in 1980 to 108 in 1990, and the number of young fledged per year increased from 19 to 130. In 1991, 149 nesting sites were documented, out of which 87 pairs fledged a total of at least 153 young. Montana has an active bald eagle working group comprised of representatives from Federal and State agencies, universities, conservation groups, and private industry. The group advises in the recovery, research, management, inventory, and monitoring of the bald eagle and its habitat in Montana. Of the hundreds of section 7 consultations carried out since 1990, most have been informal and have resulted in slight (if any) project modifications while conserving eagles and their habitat. No jeopardy biological opinions have been issued, and no projects have been stopped.

Partnerships

Bureau of Land Management, Forest Service, Bureau of Reclamation, Bureau of Indian Affairs, and National Park Service: When possible, these Federal agencies assist with monitoring bald eagle nesting populations, conducting winter surveys, and protecting sites of eagle concentrations.

Montana Department of Fish, Wildlife, and Parks: This is the primary State agency responsible for monitoring the nesting and wintering population status of the bald eagle. It provides technical assistance in managing bald eagle habitat in Montana.

Paul W. Sykes, Jr

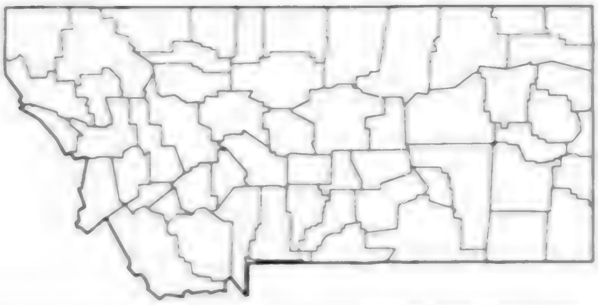
Plum Creek Timber Company, Montana Power Company, Montana Audubon Council, Montana State University, University of Montana, Champion International Timber Company, Salish and Kootenai Tribes, and Kewit Mining Group: These organizations assist with monitoring bald eagle populations and facilitating research (e.g., fall habitat use and migration patterns) on bald eagles. These organizations assist by providing funding and allowing access to property, as well as providing comments on research and management priorities to the Fish and Wildlife Service and the State.

Recovery Plan Status: Plan approved 7/29/83.

Montana

Black-footed Ferret*

(*Mustela nigripes*)—Endangered



*Extirpated from the wild in Montana.

Current Status: Black-footed ferrets prey almost exclusively on prairie dogs. The primary threat to the ferret's recovery is the continued loss of prairie dog colonies, principally from poisoning. Such poisoning degrades and fragments ferret habitat, resulting in only small islands of prairie dog colonies. Very few sites have been identified as suitable for ferret reintroduction.

Achievements: Success of the captive breeding program for the ferret has exceeded all expectations, yielding enough animals to support a ferret reintroduction program. In 1991, ferrets were reintroduced into the wild in Wyoming for the first time. Plans are under way for a draft environmental impact statement and proposed rule on reintroducing a nonessential experimental population of black-footed ferrets on the Charles M. Russell National Wildlife Refuge in Montana. The Service will seek public involvement in the environmental impact statement process and any reintroduction proposal. Through section 7 consultation with the Bureau of Indian Affairs, the Service is encouraging tribes on the Fort Belknap and Northern Cheyenne Indian Reservations to develop prairie dog management plans that allow conservation of enough prairie dogs for recovery of the ferret.

Tim W. Clark

Current Recovery Needs: Increased funding will be needed to locate, develop, and manage ferret reintroduction sites across the West. Also, efforts are needed to stem the loss of prairie dog colonies. Federal land management agencies can assist by developing prairie dog management plans for public lands and by publicizing the benefits of prairie dog conservation to wildlife advocates and livestock grazers.

Section 6 Funding and Activities: The Montana Department of Fish, Wildlife, and Parks was provided $30,000 in FY 1991 and $15,000 in FY 1992 to prepare, in coordination with local landowners, management plans for reintroducing black-footed ferrets into Montana.

Partnerships

Bureau of Land Management: This Federal agency is helping to develop plans for a proposal to reintroduce black-footed ferrets into Montana. The Bureau has assisted by delineating prairie dog colonies in the potential reintroduction area, and has provided logistical and financial support for the ferret program in Montana.

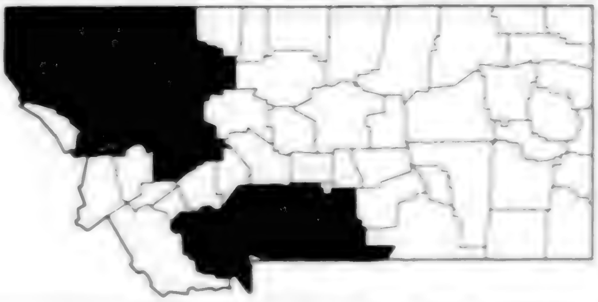
Montana Department of Fish, Wildlife, and Parks: The Department maps potential ferret reintroduction sites and provides financial, administrative, and logistical support.

Recovery Plan Status: Original plan approved 6/14/78; revised 8/8/88.

Montana

Gray Wolf

(*Canis lupus*)—Endangered



Current Status: The only significant threat to wolves in Montana is illegal killing, primarily through shooting. Habitat and prey are ample to support more than the 10 breeding pairs recommended by the recovery plan.

Achievements: Wolves denned in Montana in 1986 for the first time in many years. During recent years, 41 wolves have been radio-collared and studied. Using radio-telemetry, biologists are monitoring five packs in Montana and two other packs (one that straddles the U.S./Canada border and a second just north of the border) that are part of the same population. The Montana packs produced four litters in 1992, totalling at least 18 pups. In 1992, the other two packs produced 13 pups, which may disperse into the Montana population. Single dispersing wolves are probably living in various parts of western Montana but, due to their elusive nature, are nearly impossible to census. A lone male, being monitored by tracks and sign, has established a territory in the Bob Marshall Wilderness; a radio-collared male wolf from Glacier National Park has settled in Idaho; an apparent wolf was filmed in Yellowstone National Park in August 1992; a wolf was killed just south of the Park border in September 1992; and there has been confirmed wolf activity in Montana 240 miles south of the Canadian border. In 1988, an interagency Wolf Working Group, consisting of the Fish and Wildlife Service, Forest Service, Bureau of Land Management, National Park Service, Department of Agriculture's Animal Damage Control Division, Blackfoot Nation, Flathead Nation, and Montana's State Lands Department, was established to coordinate wolf recovery, and a three-phase monitoring system now documents wolf presence in Montana.

The Fish and Wildlife Service, with cooperation from the Department of Agriculture's Animal Damage Control program, has captured 16 wolves since 1987, including 7 during 1990 and 1992. Of the 16, 2 were radio-collared and released on site, 5 were killed, 2 were placed in captivity, and 7 were translocated. Wolves verified for a first-time depredation are translocated and released; while wolves verified for subsequent depredations are removed from the wild. These actions slowed population growth, but reduced local animosity and very likely illegal killing of wolves, thus encouraging tolerance of wolf recovery in the long-term. Montana's wolf population has attained half the recovery goal of 10 breeding pairs (for 3 successive years) recommended in the Northern Rocky Mountain Wolf Recovery Plan. In 1991, Congress directed the Fish and Wildlife Service, in consultation with the National Park Service and the Forest Service, to prepare an Environmental Impact Statement for wolf reintroduction into Yellowstone National Park and central Idaho. This project is under way.

Since 1990, the Fish and Wildlife Service has conducted several hundred informal section 7 consultations annually in Montana. Consultations concerning timber harvests, oil and gas exploration, mining, road management plans, grazing allotment management, and other issues were done in conjunction with other endangered species issues in the areas of concern. No mitigation measures were needed to protect wolves, and no jeopardy biological opinions have been issued.

Current Recovery Needs: Continued educational efforts and wolf control to increase public tolerance for the species are the greatest needs.

Partnerships

National Park Service, Forest Service, Bureau of Land Management, and Department of Agriculture's Animal Damage Control Division: The first two agencies have funded research efforts. The Animal Damage Control Division has been involved in all wolf control activities. The Forest Service also is monitoring wolves on various national forests. Also cooperating in these efforts are the Confederated Salish and Kootenai Tribes, The Blackfoot Nation, University of Montana, and Montana Department of Livestock.

Montana Department of Fish, Wildlife, and Parks; Montana Department of State Lands; and Missoula County: Montana has proposed that the wolf be federally delisted and managed under the State's Nongame and Endangered Species Act. The Montana Department of Fish, Wildlife, and Parks has chosen not to be a formal member of the interagency Wolf Working Group, but has designated an individual to represent its interests. The Montana Department of State Lands has

FWS File Photo

signed an agreement indicating willingness to assist with monitoring and related needs. Missoula County has promoted wolf recovery, offering county lands as release sites for translocations of wolves that kill livestock.

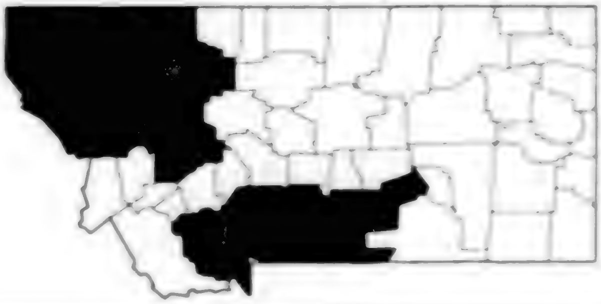
National Wildlife Federation, Defenders of Wildlife, Wolf Haven International, and University of Montana: The National Wildlife Federation has assisted with public education efforts. Defenders of Wildlife has a program compensating ranchers for livestock lost to wolves, as well as a reward system for landowners on whose property wolves successfully raise a litter. Wolf Haven International has sponsored surveys, has been active in public education, and has accepted wolves into its captive facility. The University of Montana has researched wolf prey along the Northfork of the Flathead River area.

Recovery Plan Status: Original plan approved 5/28/80; revised 8/3/87.

Montana

Grizzly Bear

(*Ursus arctos horribilis*)—Threatened



Current Status: Grizzly bear populations have responded favorably to recovery zone management in the three Montana ecosystems in which they occur. However, in certain areas of the Northern Continental Divide Ecosystem, local segments of the population appear to be diminishing. Major threats to the grizzly bear include habitat loss and degradation, primarily attributable to increased road-building on public lands and residential and commercial development of private lands. Quality low-elevation habitat, including essential spring range, is often located on private lands, where the potential for human-bear conflict is high.

Achievements: State and Federal agencies involved in recovery efforts continue to implement the population and habitat management policies detailed in the 1986 Interagency Grizzly Bear Guidelines. Human-caused bear mortality has declined over the past decade in the Northern Continental Divide Ecosystem and the Yellowstone Grizzly Bear Ecosystem. Interagency efforts, including sanitation measures, public education, habitat management, and bear nuisance management, have contributed to this decline. Both populations appear stable except for some local segments in the Northern Continental Divide Ecosystem. Population estimates are a minimum of 400 for the Northern Continental Divide Ecosystem and 228 for the Yellowstone Grizzly Bear Ecosystem.

As a result of augmentation efforts in the Cabinet-Yaak Ecosystem, two female grizzlies from British Columbia were successfully added to the small population in the Cabinet Mountains Wilderness Area. In 1991, after a 5-year habitat study, the Interagency Grizzly Bear Committee approved an additional Montana ecosystem, the Bitterroot Mountains, for bear recovery efforts. Although the Bitterroot Mountains have had a grizzly population in the past, there is no known population at present. This additional recovery zone will contribute greatly to the bear's recovery.

Of the several thousand section 7 consultations carried out since 1990, most have been informal and have resulted in slight (if any) project modifications while conserving grizzlies and their habitat.

Current Recovery Needs: Recovery will require continued monitoring in each ecosystem; habitat conservation through continued application of the Interagency Grizzly Bear Guidelines in recovery zones; continued public information programs; sanitation projects, such as the removal of food sources (e.g., garbage dumps) that attract bears into areas of human activity, by Federal, State, and local governments; and development of a plan for recovery efforts in the Bitterroot Ecosystem.

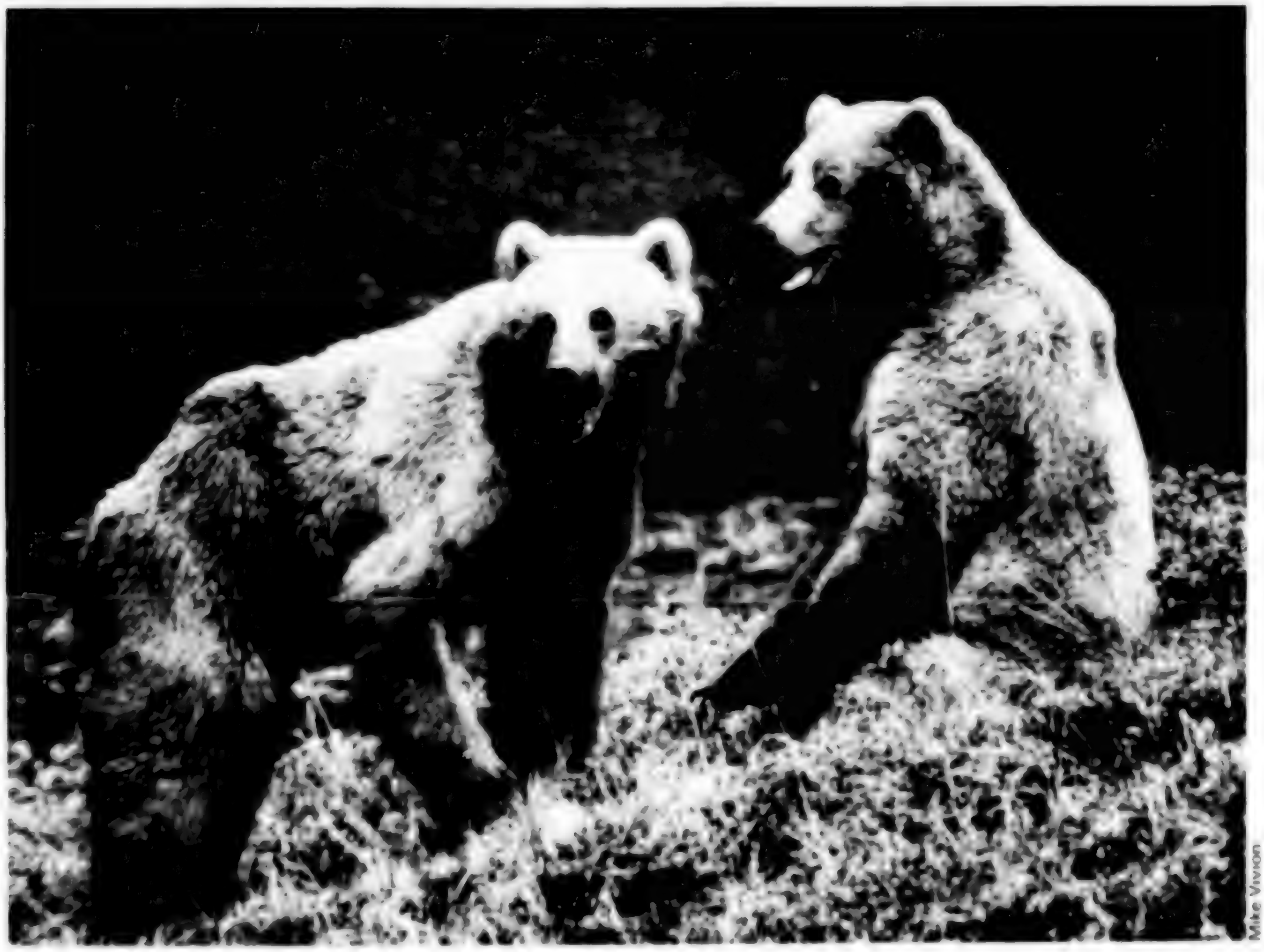
Section 6 Funding and Activities: The Montana Department of Fish, Wildlife, and Parks was provided $90,000 in FY 1991 and again in FY 1992 for gathering information on grizzly bear habitat and population conditions.

Partnerships

Forest Service: Because grizzly bear habitat occurs primarily on national forests, this Federal agency has primary responsibility for grizzly bear habitat management in Montana. It compiles annual population monitoring records for the Northern Continental Divide Ecosystem and participates in monitoring the Yellowstone Grizzly Bear Ecosystem. On several national forests, the Forest Service has initiated educational projects and sanitation measures that have reduced human-bear conflicts.

National Park Service: The National Park Service is the lead agency for population monitoring in Yellowstone and Glacier National Parks, and is responsible for nuisance bear management in the parks, including control actions specified in the Interagency Grizzly Bear Guidelines. This Federal agency implements management measures to make visitor use and recreation compatible with bear recovery and habitat conservation. The National Park Service also has information and education programs, and enforces sanitation measures that have significantly decreased human-bear conflict.

Bureau of Land Management: In conducting management of lands under its jurisdiction, this Federal agency conserves bear habitat, works to make multiple-use



Mike Vivion

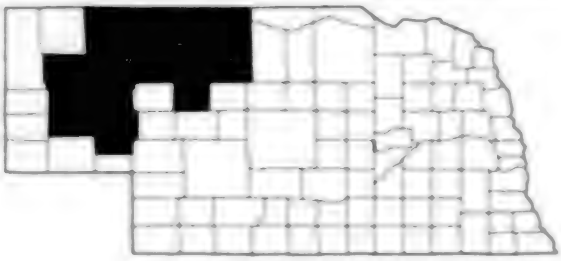
objectives compatible with grizzly bear recovery, and cooperates in handling nuisance bear problems.

Montana Department of Fish, Wildlife, and Parks: The Department participates in grizzly bear monitoring and has primary responsibility for managing nuisance bears on private, State, and Federal lands outside national parks. The Department has also initiated successful information and education programs, as well as proactive management programs on private lands that have reduced nuisance bear problems.

Recovery Plan Status: Plan approved 1/29/82.

Nebraska

Species Name	*Status*
Crane, whooping	E
Curlew, Eskimo	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, least (interior population)	E
Sturgeon, pallid	E
Pearly mussel, Higgins' eye	E
Beetle, American burying (=giant carrion)	E
Orchid, western prairie fringed	T
Penstemon, blowout	E



Blowout Penstemon

(*Penstemon haydenii*)—Endangered

Current Status: This stout perennial herb in the snapdragon family has adapted itself to the environmental extremes of active blowouts—conical or irregular craters scooped out of deep, loose sands by swirling winds. The penstemon reproduces by rhizomes, sending out shoots at progressively higher stem nodes as the sands build. When blowouts are stabilized and revegetated by other plants, the penstemon cannot compete. Insects and drought also threaten the species' survival.

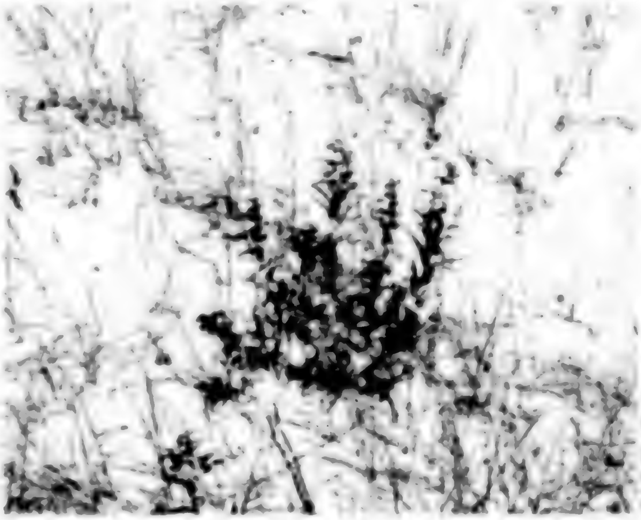
Achievements: A recovery plan was completed in 1992 for this plant, which is endemic to the Nebraska Sandhills. One of the primary recovery actions identified is the establishment of four new populations. Greenhouse and field studies have resulted in successful propagation and transplant methods. Annual population monitoring revealed that a species of moth threatened one population in 1991, but this discovery led to the identification of insecticides that could be applied safely.

Current Recovery Needs: Establishing at least four additional viable populations, developing and implementing management plans for natural and introduced populations, and monitoring and protecting natural and introduced populations need to be accomplished for reclassifying this endangered plant to threatened status.

Section 6 Funding and Activities: Monitoring populations, identifying insect pests and their control, determining effects of grazing and disturbance factors, and assessing genetic variability were projects undertaken with $15,200 of section 6 funding in FY 1992 by the Nebraska Game and Parks Commission.

Partnerships

Forest Service: The Forest Service is identifying and searching potential habitat for the species. If the species is found on Forest Service land, the agency will monitor, manage, and protect the site.



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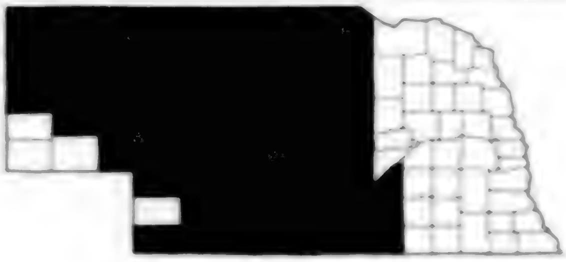
Nebraska Game and Parks Commission: With primary recovery responsibility for the species, the Commission is using section 6 and agency funding for recovery. It led in the preparation of the recovery plan.

University of Nebraska at Lincoln: The Department of Agronomy has conducted research to determine propagation and reintroduction methods.

The Nature Conservancy: The Conservancy has purchased and is managing property containing one of the largest populations.

Recovery Plan Status: Plan approved 7/17/92.

Nebraska



Whooping Crane

(*Grus americana*)—Endangered

Current Status: Reduced flows in the Platte River due to upstream water diversion for human and agricultural uses have destroyed much of the formerly suitable feeding and roosting habitat for the cranes. Avian tuberculosis and cholera are potential threats in Nebraska if continued riverine habitat degradation pushes the birds into less favorable habitats where these diseases are more abundant.

Achievements: In the fall of 1992, the Cooperative Whooping Crane Tracking Project monitored whooping cranes from Canada, through Montana, South Dakota, North Dakota, Nebraska, Kansas, and Oklahoma, to the wintering habitat at Aransas National Wildlife Refuge on the Texas coast. Cooperators in the project include the Fish and Wildlife Service, the State Fish and Game Department of each State in the Flyway, Canadian Wildlife Service, National Audubon Society and other conservation organizations, and private individuals.

Steve von Riper

The estimated migratory count was 136 birds, compared to 132 the previous year. A record 53 cranes also were confirmed stopping in Nebraska during the spring 1992 migration. During fall and spring migrations, Tracking Project staff alert cooperators to disease outbreaks, making it possible to monitor or direct cranes away from hazardous areas.

Current Recovery Needs: At a minimum, the Wood Buffalo-Aransas population needs to grow to 40 nesting pairs, and 2 other self-sustaining populations need to be created, with 25 nesting pairs each, for reclassification from endangered to threatened status to occur. Priority has been given to identifying and solving problems connected with bird loss on the wintering and nesting grounds as well as during migration. Maintaining suitable river flows at appropriate times to provide roosting and feeding sites along the Platte River is another recovery need.

Partnerships

Nebraska Game and Parks Commission: The Commission monitors migrant whooping cranes and evaluates stopover sites.

The Platte River Whooping Crane Habitat Maintenance Trust, Inc.: As mitigation for the Grayrocks Dam construction on a North Platte tributary, the Trust was established to protect the physical, hydrological, and biological integrity of the Platte River as a life-support system for the whooping crane and other migratory species. The Trust has purchased more than 8,000 acres, including 16½ miles of river frontage, during the past 10 years. It has restored about 9 miles of crane roosting habitat and 200 acres of grassland.

National Audubon Society: The Society manages a sanctuary for cranes, educates the public about cranes, and provides opportunities for viewing cranes.

Recovery Plan Status: Original plan approved 4/12/85; revised 12/23/86.

Nevada

Species Name	*Status*
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Tortoise, desert	T
Chub, bonytail	E
Chub, Pahranagat roundtail (=bonytail)	E
Chub, Virgin River	E
Cui-ui	E
Dace, Ash Meadows speckled	E
Dace, Clover Valley speckled	E
Dace, desert	T
Dace, Independence Valley speckled	E
Dace, Moapa	E
Poolfish (=killifish), Pahrump	E
Pupfish, Ash Meadows Amargosa	E
Pupfish, Devils Hole	E
Pupfish, Warm Springs	E
Spinedace, Big Spring	T
Spinedace, White River	E
Springfish, Hiko White River	E
Springfish, Railroad Valley	T
Springfish, White River	E
Sucker, razorback	E
Trout, Lahontan cutthroat	T
Woundfin	E
Naucorid, Ash Meadows	T
Blazing-star, Ash Meadows	T
Buckwheat, steamboat	E
Centaury, spring-loving	T
Gumplant, Ash Meadows	T
Ivesia, Ash Meadows	T
Milk-vetch, Ash Meadows	T
Niterwort, Amargosa	E
Sunray, Ash Meadows	T

Desert Dace

(*Eremichthys acros*)—Threatened

Nevada Department of Wildlife

Current Status: Desert dace occupy 10 spring systems in Soldier Meadows, Humboldt County, Nevada. All warm spring habitats with permanent outflow streams and water temperatures ranging from 13° to 37°C currently support desert dace. Threats to the species include habitat modification due to diversion of water for agricultural irrigation, trampling, and overgrazing by cattle and wild horses; loss of spring flow due to geothermal exploration and development; and introduction of competing or predaceous nonnative fish species.

Achievements: The Nature Conservancy initiated the Soldier Meadows Conservation Project in cooperation with a private landowner and the Bureau of Land Management to protect all habitats occupied by the desert dace. The Nature Conservancy has purchased some of the private land and obtained a conservation easement on the remainder. Most of the purchased lands will be sold to the Bureau of Land Management for inclusion in its Soldier Meadows Area of Critical Environmental Concern. Following this transfer of title, all desert dace habitat will be on public lands.

Current Recovery Needs: The Bureau of Land Management, in consultation with the Fish and Wildlife Service, needs to develop a management plan for Soldier Meadows to ensure protection of desert dace habitats on public lands.

Partnerships

Bureau of Land Management: This Federal agency will manage desert dace habitat to provide optimum conditions for the species. The Bureau will revise its management plan for the Soldier Meadows Area of Critical Environmental Concern to include objectives for desert dace habitats.

The Nature Conservancy: This private organization initiated the conservation of Soldier Meadows by purchasing private land and obtaining a conservation easement to protect desert dace habitat on other private lands.

Recovery Plan Status: Plan under development.

Pahrump Poolfish

(*Empetrichthys latos*)—Endangered

Current Status: Pahrump poolfish are endemic only to Manse Spring in southern Nevada, but have been extirpated from this habitat. When it became apparent that local ground water pumping would dry up Manse Spring, Pahrump poolfish were transplanted into the Corn Creek Springs on the Fish and Wildlife Service's Desert Game Range in southern Nevada. Subsequently, fish from the Corn Creek population have been utilized to establish two additional Pahrump poolfish populations in Nevada. These three populations are thriving, but are vulnerable to habitat modifications resulting from natural vegetative succession and loss of spring flow due to ground water pumping.

Achievements: State appropriated or Federal reserve water rights exist for all springs currently supporting Pahrump poolfish populations. Excessive emergent vegetation has been removed from the Corn Creek ponds to improve habitat conditions for Pahrump poolfish. The three populations have maintained, and generally exceeded, at least 500 individuals for at least 3 years. These population levels have met the criteria established in the Pahrump Poolfish Recovery Plan for consideration of reclassification from endangered to threatened status. The Service is currently considering a proposal to reclassify the fish from endangered to threatened status.

FWS File Photo

Section 6 Funding and Activities: In both FY 1991 and FY 1992, the Nevada Department of Wildlife received $4,100 for Pahrump poolfish monitoring and habitat management activities.

Partnerships

Bureau of Land Management: This Federal agency manages Shoshone Ponds, southeast of Ely, Nevada, which supports a population of Pahrump poolfish. The Bureau recognizes the importance of maintaining the habitat supporting this poolfish population and manages the ponds to provide optimum habitat conditions.

Nevada Division of State Parks: The irrigation reservoir on the Spring Mountain State Park in southern Nevada supports a population of Pahrump poolfish. The Nevada Division of State Parks allowed resident game fish to be removed from the pond in preparation for release of Pahrump poolfish, and have been cooperating with the Nevada Department of Wildlife to maintain the habitat.

Nevada Department of Wildlife: The Nevada Department of Wildlife annually determines the size of all three Pahrump poolfish populations and monitors their respective habitat conditions.

Recovery Plan Status: Plan approved 3/17/80.

New Hampshire

Species Name	*Status*
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Mussel, dwarf wedge	E
Beetle, Puritan tiger	T
Cinquefoil, Robbins'	E
Milk-vetch, Jesup's	E
Pogonia, small whorled	E

New Hampshire

Robbins' Cinquefoil

(*Potentilla robbinsiana*)—Endangered

Garrett E. Crow

Current Status: Only two populations of this species are known. Preliminary analysis of 1992 census data indicates that the largest population has stabilized and may be at or above the level it was at when the species was listed in 1980. Natural events, such as excessive runoff, and inadvertent trampling are continuing threats.

Achievements: The two existing populations of Robbins' cinquefoil, located on Forest Service lands, have been intensively monitored since 1980. Expanded public outreach (e.g., distribution of pamphlets), design and construction of a permanent educational display for the Appalachian Mountain Club, and rerouting of a hiking trail have had positive effects on the population. The species occurs in the vicinity of the Appalachian Trail.

Current Recovery Needs: The recovery of Robbins' cinquefoil will require continued management to protect the main population, expansion of long-term demographic and biological analyses to determine population stability, establishment of four additional viable populations, and recolonization of extirpated sites.

Partnerships

Forest Service: The White Mountain National Forest provides permanent protection for Robbins' cinquefoil and its habitat, and the Forest Service provides funding for monitoring and demographic studies.

Appalachian Mountain Club: This private organization has made considerable progress in public education and outreach. With Fish and Wildlife Service funding, the Appalachian Mountain Club completed a permanent display on Robbins' cinquefoil and developed educational programs. Additionally, the Appalachian Mountain Club, in cooperation with the Forest Service, established a cinquefoil "viewing garden." It also has collected seeds and is exploring the cultivation of plants for future transplantation.

Recovery Plan Status: Plan approved 7/22/83.

New Hampshire

Small Whorled Pogonia

(*Isotria medeoloides*)—Endangered

Current Status: Primary rangewide threats to the small whorled pogonia are habitat destruction from residential and commercial development and habitat degradation from recreational use, particularly by off-road vehicles. Vandalism, the formation of barriers (e.g., clearings, development) to seed dispersal, and increased herbivory on plants by deer herds are also threats.

Achievements: Public awareness of this orchid has increased because of outreach efforts, including the distribution of pamphlets and recovery plans, and recruitment of volunteers for monitoring and surveying. These efforts have resulted in the discovery of two additional populations and several subpopulations (previously unknown colonies located relatively near known populations) in New Hampshire. Also, the University of New Hampshire has initiated graduate research to model small whorled pogonia habitat using Geographical Information Systems (GIS) and statistical analyses, is pursuing genetic investigations, and is acquiring habitat for protection, education, and research. About a third of the known sites in New Hampshire have some protection. In addition, landowner contributions and State and town conservation efforts have resulted in permanent protection of what appears to be the largest known population of small whorled pogonias.

Current Recovery Needs: Further recovery will require actions such as continuing to monitor populations, contacting landowners with the goal of acquiring conservation easements, initiating habitat management studies and life history investigations, and increasing public awareness of the species throughout its range.

Section 6 Funding and Activities: The New Hampshire Natural Heritage Inventory (State Department of Resources and Economic Development) received $5,000 in FY 1991 and $7,000 in FY 1992 to census known populations and survey historic and new sites.

C. Fichtel

Partnerships

New Hampshire Natural Heritage Inventory: This agency is working to identify ownership of all known populations, continue detailed demographic studies of selected sites, and monitor sites. Land status information has been obtained for more than 95 percent of the known sites in New Hampshire, which are currently being surveyed. As part of a State demographic study, 11 of the 32 extant sites have one or more established study plots and are monitored annually. In addition, the New Hampshire Natural Heritage Inventory has established plots at more than 11 sites to determine plant dormancy rates, habitat characteristics, and other life history parameters. The agency is pursuing habitat protection through landowner contacts and public outreach.

University of New Hampshire: The University is assessing known habitat characteristics, determining the components of preferred habitat, developing models to predict the location of potential habitat, and surveying areas identified by these models. The University is investigating habitat characteristics of the majority of sites in New Hampshire for incorporation into GIS.

The Nature Conservancy: The Conservancy is developing conservation plans for protected sites and seeking the support of private landowners through habitat conservation agreements. Landowner contacts are being pursued for voluntary natural areas registration. Registry is a non-binding, non-regulatory program that recognizes landowners who have voluntarily agreed to protect natural features on their lands. At least three areas with deeded conservation easements and one site owned by The Nature Conservancy will be managed as preserves.

The New England Wildflower Society: This organization is continuing its detailed demographic studies of the largest known population, annually monitoring more than 1,300 plants for reproductive status, habitat parameters, and rate of dormancy. The Society will analyze 10 years of data it has collected.

Recovery Plan Status: Original plan approved 1/16/85; revised 11/13/92.

New Jersey

Species Name	*Status*
Bat, Indiana	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Turtle, hawksbill sea (=carey)	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Beetle, northeastern beach tiger	T
Beaked-rush, Knieskern's	T
Chaffseed, American	E
Joint-vetch, sensitive	T
Pink, swamp	T
Pogonia, small whorled	E

New Jersey

Swamp Pink

(*Helonias bullata*)—Threatened

Current Status: The most serious threats to the swamp pink are the filling, clearing, and draining of its forested wetland habitat. Additionally, development is gradually degrading the species' forested wetland habitat through changes in hydrological conditions and influxes of polluted water and sedimentation. Collection, trampling, and invasions of aggressive non-native plant species also threaten the swamp pink.

Achievements: Approximately 20 previously unknown populations have been located in New Jersey through surveys and Clean Water Act enforcement actions in the past 2 years. Although these findings are encouraging, most of the sites are experiencing significant threats from development. The swamp pink recovery plan was completed in FY 1991, and several recovery tasks are under way, including research on genetics, habitat requirements, and the impacts of disturbances; development of conservation plans; searches for additional sites; and enforcement of regulations that protect swamp pink habitat. Section 7 consultation between the Fish and Wildlife Service and the Environmental Protection Agency resulted in the protection of a swamp pink population from hazardous waste remediation activities at a Superfund National Priorities List site.

Current Recovery Needs: This species will need continued habitat protection, which may include protection of an entire upstream watershed to maintain water quality and hydrological conditions, determination and monitoring of threats to extant sites, completion of searches for additional populations, public education, and genetic research.

Section 6 Funding and Activities: The New Jersey Division of Parks and Forestry was provided $8,000 in FY 1991 and $3,000 in FY 1992 to develop swamp pink preserve designs and to determine the impacts of disturbance and development on selected populations.

Partnerships

Army Corps of Engineers: In 1990, the Corps issued a public notice directing section 404 (Clean Water Act) permittees to ensure that any work performed in New Jersey and Delaware under nationwide permits avoids impacts on the swamp pink. As a result, the Fish and Wildlife Service has been notified of several projects subject to nationwide permits that would have affected the species; projects were modified as necessary. The Corps has also ensured protection of the swamp pink on projects subject to individual permits.

New Jersey Division of Parks and Forestry: This State agency has completed a research project to determine the effects of disturbance on selected populations and has developed conservation plans for three high priority populations. The agency has also conducted searches for new sites.

University of Georgia: The University initiated research in 1992 to conduct genetic analyses on selected swamp pink populations throughout the species' range.

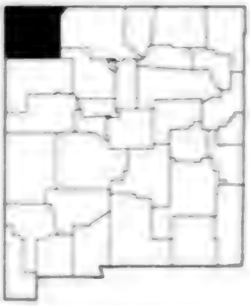
Recovery Plan Status: Plan approved 9/30/91.

David Snyder

New Mexico

Species Name	*Status*
Bat, Mexican long-nosed	E
Bat, Sanborn's long-nosed	E
Crane, whooping	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Tern, least (interior population)	E
Rattlesnake, New Mexican ridge-nosed	T
Chub, Chihuahua	T
Gambusia, Pecos	E
Minnow, loach	T
Shiner, beautiful	T
Shiner, Pecos bluntnose	T
Spikedace	T
Squawfish, Colorado	E
Sucker, razorback	E
Topminnow, Gila (incl. Yaqui)	E
Trout, Gila	E
Woundfin	E
Springsnail, Alamosa	E
Springsnail, Socorro	E
Isopod, Socorro	E
Cactus, Knowlton	E
Cactus, Kuenzler hedgehog	E
Cactus, Lee pincushion	T
Cactus, Lloyd's hedgehog	E
Cactus, Mesa Verde	T
Cactus, Sneed pincushion	E
Fleabane, Zuni (=rhizome)	T
Milk-vetch, Mancos	E
Pennyroyal, McKittrick	T
Pennyroyal, Todsen's	E
Prickly-poppy, Sacramento	E
Thistle, Sacramento Mountains	T
Wild-buckwheat, gypsum	T

New Mexico



Colorado Squawfish

(*Ptychocheilus lucius*)—Endangered

Current Status: Several factors threaten the Colorado squawfish in the San Juan River, including destruction of floodplain habitat, reduction of spring flows, alteration of natural hydrography, flow fluctuations for hydropower production, fish passage barriers, cold water temperatures below mainstem reservoirs, competition with and predation by nonnative fishes, and contaminants.

Achievements: As a result of the biological opinion for the section 7 consultation on the Animas-La Plata project, a 7-year research program on the San Juan River is under way to provide information for recovery of the endangered fishes, including the Colorado squawfish, and for assessing future water depletions. In FY 1991, research efforts included adult monitoring and radio tracking, early life history research, secondary channel studies, habitat/flow studies, genetics surveys, water quality surveys, physical habitat surveys, and distribution and abundance surveys. In FY 1992, studies were initiated to identify and quantify limiting factors, determine environmental requirements, and quantify response of the fishes to experimental flow regimes. Additionally, the San Juan River Basin Recovery Implementation Program has been initiated. Major elements of this program include genetics management and population augmentation; protection, management, and augmentation of habitat; water quality protection and enhancement; determination of interactions between the Colorado squawfish and nonnative fish species; and monitoring and data management. State and Federal agencies are contributing money, expertise, and/or in-kind services to achieve the goals of both programs. With regard to section 7 consultations, Bureau of Reclamation water sales received a no-jeopardy biological opinion, and the Bureau of Indian Affairs received a jeopardy opinion on its Navajo Irrigation Project, Blocks 1-8 (although the Fish and Wildlife Service suggested reasonable and prudent alternatives for modifying the project).

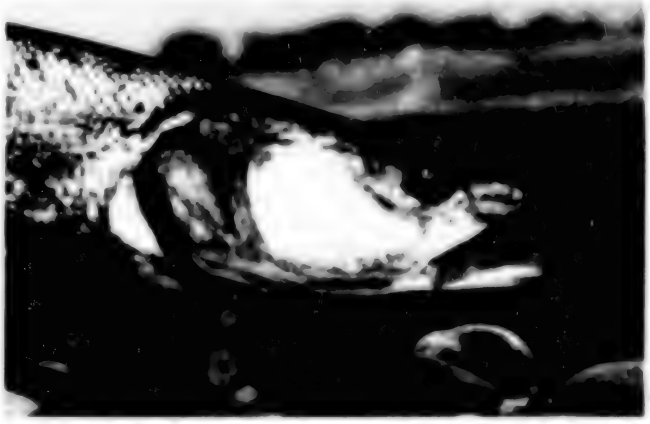
Current Recovery Needs: Because of the many threats to Colorado squawfish, a variety of measures will be needed for the species' recovery, including extensive habitat restoration, control of nonnative fishes, improvements in water quality, and reintroductions of the species to historic habitats.

Partnerships: Because differences exist among the issues and interests in San Juan River sub-basins, several programs are being conducted to recover the Colorado squawfish and the river's other endangered fishes. Two programs are being conducted in New Mexico, the San Juan River Seven Year Research Plan and the San Juan River Basin Recovery Implementation Program:

San Juan River Seven Year Research Plan: This program is being conducted to determine the physical, chemical, and biological factors limiting native fish populations in the San Juan River and to provide management options to conserve and restore the endangered fish community. Federal agencies participating are the Fish and Wildlife Service, Bureau of Reclamation, and Bureau of Indian Affairs. State participants include the Utah Division of Wildlife Resources, Colorado Division of Wildlife, and New Mexico Game and Fish Department.

San Juan River Basin Recovery Implementation Program: The purpose of this program is to protect and recover endangered fishes in the San Juan River basin while water development proceeds. Federal agencies participating include the Fish and Wildlife Service, Bureau of Reclamation, and Bureau of Indian Affairs. The States of Utah, Colorado, and New Mexico are also participating, as is local government. Other participants include the Navajo Nation, Southern Ute Indian Tribe, Ute Mountain Ute Indian Tribe, Jicarilla Apache Indian Tribe, and non-Federal water development interests.

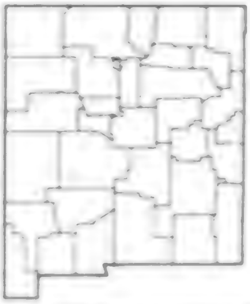
Recovery Plan Status: Original plan approved 3/16/78; revised 8/6/91.



J.E. Johnson

Gray Wolf*

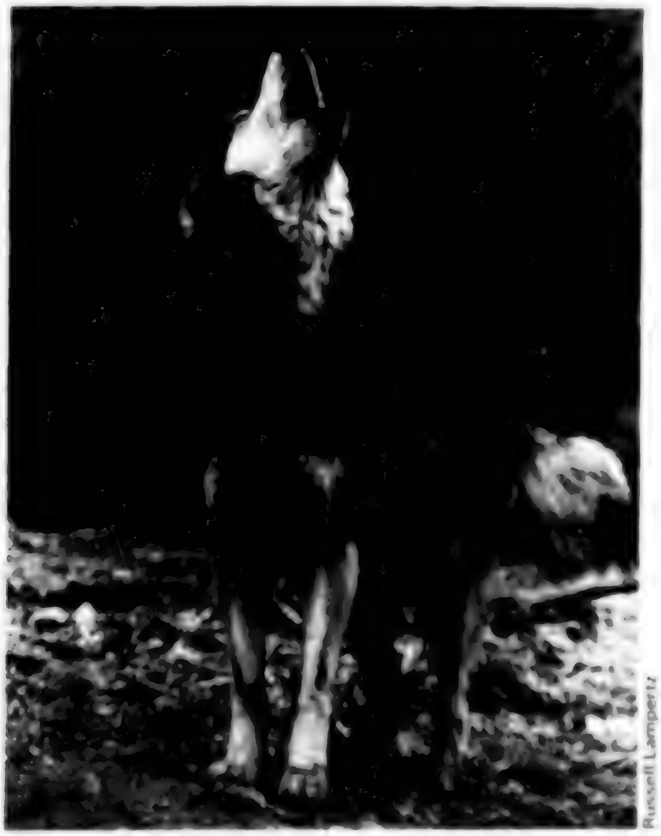
(*Canis lupus*)—Endangered



*Extirpated from the wild in New Mexico.

Current Status: Wild populations of the subspecies of gray wolf occurring in New Mexico, known as the Mexican wolf (*Canis lupus baileyi*), are extirpated in the U.S. and possibly in Mexico, but the Mexican wolf's status is improving in captivity. Threats to any wild populations include possible illegal killing, a small genetic base, and human encroachment on the remaining habitat.

Achievements: By the mid-1900s, the Mexican wolf was eliminated from the U.S. portion of its historic range. In the late 1970s, five wolves were captured in Mexico and delivered to the Arizona-Sonora Desert Museum near Tucson, Arizona, for captive propagation. The captive population has grown to 50 animals (41 in 9 facilities in the U.S. and 9 in 3 facilities in Mexico). Sperm from genetically critical males has been collected and preserved, and additional captive propagation cooperators have been recruited. In addition, a full-time Mexican Wolf Recovery Coordinator position was established.



Russell Lampertz

Current Recovery Needs: Necessary recovery actions include surveys to determine the species' status in Mexico; evaluations of sighting reports in the U.S. and follow-up surveys, if warranted; monitoring and protection of any remaining wild wolves; increasing the captive breeding population; genetically evaluating two uncertified captive populations to determine if they are pure; collecting and banking sperm for future use; reintroducing captive-bred wolves into historic habitat; monitoring and managing any reintroduced populations; conducting research on biology/ecology and artificial propagation; and continuing public education and information activities.

Partnerships

Forest Service, Department of Agriculture's Animal Damage Control Division, National Park Service, and Department of the Army: These agencies are cooperating in the preparation of an environmental impact statement for reintroduction of the Mexican wolf into Arizona. Sites being considered for an experimental release are owned by the Forest Service, Department of the Army, and National Park Service. The Department of Agriculture's Animal Damage Control Division will play a key role in the management of any reintroduced population.

New Mexico Department of Game and Fish: The Department participates in recovery planning activities with the Mexican Wolf Recovery Team.

Living Desert State Park: The Park is a cooperator in the Mexican wolf captive propagation program.

Alameda Park Zoo and Rio Grande Zoo: Both zoos are cooperators in the Mexican wolf captive propagation program.

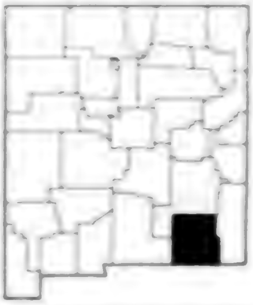
Defenders of Wildlife: Defenders of Wildlife, a national conservation organization, has established a fund to compensate livestock owners for losses that may be caused by wolves if they are reintroduced.

Recovery Plan Status: Plan approved 9/15/82.

New Mexico

McKittrick Pennyroyal

(*Hedeoma apiculatum*)—Threatened



Current Status: The McKittrick pennyroyal was listed as threatened in 1982. At that time, limited distribution, low numbers, and low reproductive potential were believed to make the species vulnerable to extinction from habitat disturbance. Since the listing, newly discovered populations have been located in remote areas of Guadalupe Mountains National Park. Park trails have been rerouted and new trails are designed to avoid known populations. As a result, the species appears secure, and plans are under way to propose delisting it.

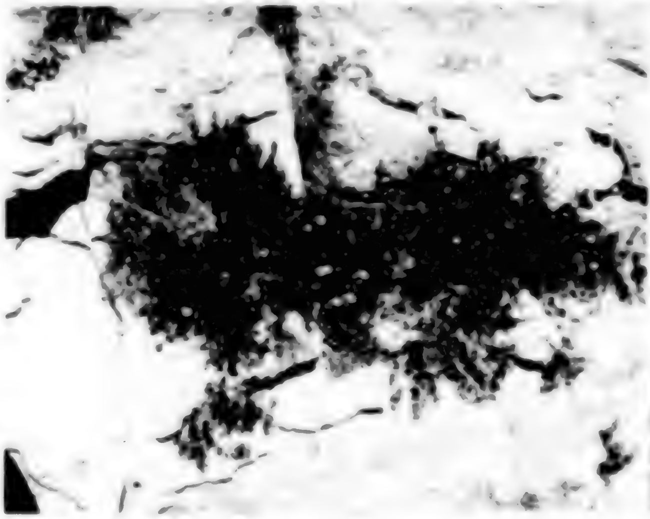
Achievements: Informal section 7 consultations have taken place with the Forest Service and Bureau of Land Management involving grazing plans, oil and gas exploration, and other activities. It was determined that none of these impacted the species due to the remote location, difficult access, and steepness of the terrain. Therefore, no formal section 7 consultations were needed.

Current Recovery Needs: If the species is delisted, its status will continue to be monitored for at least 5 years, as specified in the Endangered Species Act.

Partnerships

Forest Service: The recovery plan for McKittrick pennyroyal requires the Forest Service to monitor, manage, and evaluate development and land use changes for the species and its habitat. The Forest Service has undertaken surveys to locate populations on its lands and included the species in all biological assessments and evaluations.

Bureau of Land Management: Studies funded by the Bureau led to the discovery of additional populations of McKittrick pennyroyal. As a result, the agency is providing additional protection by designating an Area of Critical Environmental Concern for the plant in Eddy County, New Mexico.



FWS File Photo

National Park Service: This Federal agency monitors the species in the Guadalupe Mountains National Park.

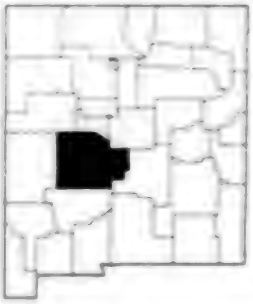
New Mexico Energy, Minerals and Natural Resources Department, Forestry and Resources Conservation Division: Through contracts with the Fish and Wildlife Service, the State of New Mexico continues to monitor the species and search for new populations among the cliffs of the Guadalupe Mountains escarpment.

Recovery Plan Status: Plan approved 4/12/85.

New Mexico

Socorro Isopod

(Thermosphaeroma thermophilus)—Endangered



Current Status: Threats to the Socorro isopod include vandalism of its extremely limited habitat in Sedillo Spring, any activity that alters the thermal spring or reduces its flow, and any activity that alters either the physical or chemical quality of the spring water. A private landowner is interested in using his share of the spring flow to provide water to construct a housing development.

Achievements: The Socorro isopod has responded to recovery actions including the construction and maintenance of a refugium, restocking after destruction of the historic population in Sedillo Spring, and captive propagation efforts. In 1989, a refugium consisting of eight concrete tanks was constructed next to the municipal water treatment facility in the city of Socorro. The city supplies water for the refugium. An 8-foot cyclone fence topped by barbed wire encloses the facility and provides protection from vandalism. Isopods placed in the refugium tanks have reproduced and are thriving.

Current Recovery Needs: The only naturally occurring population of the Socorro isopod is found in a privately owned part of Sedillo Spring. To ensure the species' survival, it will be necessary to guarantee a continuous flow of water to the habitat.

FWS File Photo

Section 6 Funding and Activities: Section 6 funds ($6,000 in FY 1989) were provided to the New Mexico Department of Game and Fish to construct a refugium at Sedillo Spring. In FY 1991, $2,000 was provided to initiate and defray costs of operation for the refugium.

Partnerships

New Mexico Department of Game and Fish: In monitoring the status of Socorro isopods, the Department has found that populations within the refugium have flourished and the population at Sedillo Spring is stable.

Recovery Plan Status: Plan approved 2/16/82.

New York

Species Name	*Status*
Bat, Indiana	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	E,T
Tern, roseate	E
Turtle, hawksbill sea (=carey)	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Snail, Chittenango ovate amber	T
Mussel, dwarf wedge	E
Beetle, northeastern beach tiger	T
Bulrush, northeastern (=barbed bristle)	E
Fern, American hart's-tongue	T
Gerardia, sandplain	E
Monkshood, northern wild	T
Pink, swamp	T
Pogonia, small whorled	E
Roseroot, Leedy's	T

Dwarf Wedge Mussel

(*Alasmidonta heterodon*)—Endangered

Current Status: The dwarf wedge mussel is threatened rangewide by municipal waste discharges; polluted storm water runoff; agricultural and non-agricultural use of pesticides, herbicides, and fertilizers; certain bank stabilization projects; removal of riparian vegetation; and adjacent development.

Achievements: The New York population of the dwarf wedge mussel, discovered in 1990 in the Neversink River during surveys conducted for the New York Natural Heritage Program, is the first report of this species from the Delaware River Basin since the early 1900s. Of the 20 known remaining locations of this species, the New York population, which occurs in an approximately 10-mile stretch of the river, is believed to be one of the largest. The discovery of this population will promote recovery efforts by providing valuable research opportunities, and will provide a potential source for reestablishing or augmenting other populations. Protection of the species' New York habitat was aided when a proposal to install riprap along the riverbank was withdrawn in favor of planting vegetation.

Dick Biggins

Current Recovery Needs: Recovery of the dwarf wedge mussel will require population monitoring, protection of existing populations and habitats, public education and cooperation, research on the species' life history and ecological requirements, and, potentially, reestablishment of mussel populations within its historic range.

Section 6 Funding and Activities: In FY 1991, the New York State Department of Environmental Conservation was provided $3,000 to document threats, research shoreline property ownership, and develop a protection and management strategy for the Neversink River population. In FY 1992, the Department was provided $9,000 to conduct research on the habitat and ecology of the dwarf wedge mussel.

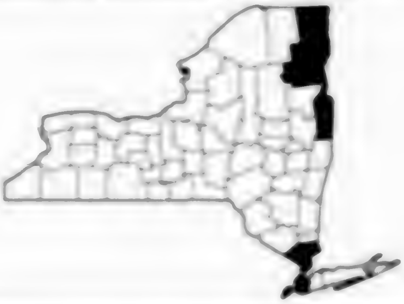
Partnerships

New York State Department of Environmental Conservation and New York Natural Heritage Program: These State agencies have ongoing efforts in research, protection, and management of the dwarf wedge mussel. A draft recovery plan identifies State agency responsibilities for the collection of data necessary for protecting, preserving, monitoring, and investigating the feasibility of reestablishing mussel populations.

The Nature Conservancy: This private organization contacts municipal and State regulatory agencies about proposed discharges and discharge permit modifications for facilities on the Neversink River. It is also working with Sullivan County regarding the County landfill.

Recovery Plan Status: Technical/Agency draft plan.

New York



Peregrine Falcon

(*Falco peregrinus*)—Endangered

Current Status: Rangewide threats to the species include human disturbance of nesting sites, habitat modification, and occasional incidence of poor productivity due to high levels of DDE (a breakdown product of the pesticide DDT) in eggshells.

FWS File Photo

Achievements: The nesting population of peregrines in New York continues to increase, with 22 territorial pairs reported in 1992. Twelve of these pairs were in and around New York City. Thirteen pairs were successful in producing 30 young in 1992. Most young were banded using a new color scheme developed to track the reestablished population.

Current Recovery Needs: Necessary recovery actions include continued surveys for new eyries, habitat protection, contaminant analysis, and public outreach.

Partnerships

New York State Department of Environmental Conservation (Bureau of Wildlife): The Department continues to be involved in activities undertaken for the peregrine's conservation, including such activities as working with the private sector (e.g., building owners) to protect and monitor urban nests.

Recovery Plan Status: Original plan approved 8/20/79; revised 9/27/91.

Roseate Tern

(*Sterna dougallii dougallii*)—Endangered

Current Status: Since its listing in 1987, the nesting population of roseate terns on the northeast coast had increased slightly to more than 3,000 pairs, but then declined by nearly 700 pairs in 1992 due to unknown causes. Disease, pollution, storms, or predation could inflict irreparable damage on the population, 90 percent of which nests at only two colonies. Competition for nesting space with an expanding population of gulls has forced roseate terns to nest in concentrated colonies or attempt to nest on unsuitable islands. Unidentified mortality factors away from the nesting grounds, presumably in wintering areas along the northern coast of South America, are exceptionally high and offset the reproductive success at managed nesting colonies. About 40 percent of the birds nest in New York, mainly on Great Gull Island, a small island to the east of Long Island.

Achievements: Selected islands are being restored as tern breeding grounds, in part by controlling the gulls that prey on tern eggs and compete with roseate terns for nesting space. In addition, structures such as open-sided nesting boxes have been used to increase fledging success where predatory birds are a problem. Signs and fencing have been used to deter human disturbance at nesting sites.

Current Recovery Needs: In New York, the top recovery priority is to reestablish a colony at Gardiner's Point Island, about 6 miles from the major colony at Great Gull Island. Other islands at Shennecock and Moriches Inlets are secondary targets for restoration. Monitoring nesting sites and long-term research of population dynamics at the major colonies must continue. A well-planned survey to locate wintering grounds, followed by evaluation of mortality factors, is essential.

Section 6 Funding and Activities: The State of New York received $6,000 in both FY 1991 and FY 1992. Some of the funds were used to monitor tern nesting populations. The remainder was allocated to the Great Gull Island project of the American Museum of Natural History for gull removal and restoration of the tern colony at Gardiner's Point Island.

Partnerships

Department of the Navy: After completing a survey of the water around Gardiner's Point Island (which is used by the Navy as a target range) for possible ordnance, the Navy authorized use of the island for the tern program.

New York Department of Environmental Conservation: This State agency is compiling data on nesting populations and will contract for habitat and population restoration management at Gardiner's Point Island and other islands at Shennecock and Moriches Inlets.

American Museum of Natural History (Great Gull Island Project and Rutgers University): The Museum is conducting research and monitoring roseate tern populations.

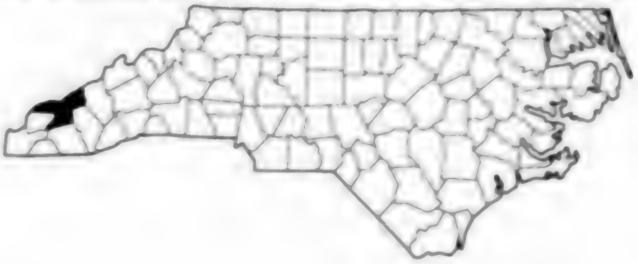
Recovery Plan Status: Plan approved 3/20/89.

North Carolina

Species Name	*Status*
Bat, Indiana	E
Bat, Virginia big-eared	E
Manatee, West Indian (=Florida)	E
Shrew, Dismal Swamp southeastern	T
Squirrel, Carolina northern flying	E
Wolf, red	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Woodpecker, red-cockaded	E
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, Kemp's (=Atlantic) ridley sea	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Chub, spotfin	T
Shiner, Cape Fear	E
Silverside, Waccamaw	T
Snail, noonday	T
Mussel, dwarf wedge	E
Pearly mussel, little-wing	E
Spinymussel, Tar River	E

Species Name	*Status*
Arrowhead, bunched	E
Avens, spreading	E
Bittercress, small-anthered	E
Blazingstar, Heller's	T
Bluet, Roan Mountain	E
Chaffseed, American	E
Dropwort, Canby's	E
Goldenrod, Blue Ridge	T
Harperella	E
Heartleaf, dwarf-flowered	T
Heather, mountain golden	T
Irisette, white	E
Joint-vetch, sensitive	T
Loosestrife, rough-leaved	E
Meadowrue, Cooley's	E
Pink, swamp	T
Pitcher-plant, green	E
Pitcher-plant, mountain sweet	E
Pogonia, small whorled	E
Pondberry	E
Spiraea, Virginia	T
Sumac, Michaux's	E
Sunflower, Schweinitz's	E

North Carolina



Little-wing Pearly Mussel

(*Pegias fabula*)—Endangered

Current Status: The little-wing pearly mussel faces water quality degradation resulting from industrial and sewage effluents and the runoff of silt and other water pollutants from poorly designed construction, development, mining, agricultural, and forestry activities. Further, the spread of the exotic zebra mussel (*Dreissena polymorpha*) represents a potential threat to the survival of this species. Zebra mussels outcompete native mussel fauna, and infestations in the water column can physically disrupt normal breeding and feeding behavior.

Achievements: Although little measurable progress has been made in establishing new mussel populations or in stabilizing existing populations, substantial recovery efforts for all the State's federally listed mussels are under way. Research is continuing on maintaining captive mussel populations, mussel cryopreservation, and potential impacts of the exotic zebra mussel on native mussels.

Current Recovery Needs: Recovery of the little-wing pearly mussel will require additional research to develop new propagation techniques, reintroduction into unoccupied historical habitat, and determination of the factors that are causing declines in the wild. Also, technology is needed for cryopreservation of freshwater mussel genetic material.

Section 6 Funding and Activities: In FY 1992, the North Carolina Wildlife Resources Commission was provided $5,000 to conduct surveys and monitor the little-wing pearly mussel, as well as the State's other federally listed mussels.

Partnerships

Forest Service: This Federal agency has funded a study of mussel distribution in the Little Tennessee River, which is inhabited by the little-wing pearly mussel.

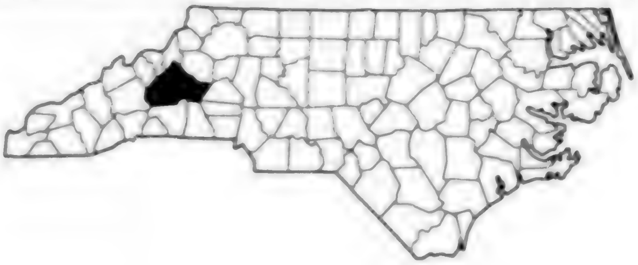
Dick Biggins

North Carolina Wildlife Resources Commission: This State agency is responsible for managing the State's mussel populations and helps protect listed species through an environmental review process and site surveys. The agency published proceedings of a symposium on North Carolina's endangered mollusks, including the little-wing pearly mussel.

North Carolina Department of Environment, Health and Natural Resources: Through maintenance of a natural history data base, this State agency provides valuable information on the distribution of federally listed mussels.

Recovery Plan Status: Plan approved 9/22/89.

North Carolina



Mountain Golden Heather

(*Hudsonia montana*)—Threatened

Current Status: Threats to this yellow-flowered shrub, currently known from only six colonies at two sites in the mountains of North Carolina, include lack of natural, recurrent fire regimes, which are necessary to maintain healthy growing conditions for the species, and trampling by hikers, campers, and rock climbers who use the area.

Achievements: A 5-year controlled burning experiment showed that this species is fire-dependent. Prescribed burns in 1990, 1991, and 1992 resulted in increases in seedling production and size of mature plants. In the spring of 1990 and 1991, seeds were collected from the most tenuous populations. These seeds were germinated in greenhouses and returned to the parent populations in the fall of 1991, where an 83 percent survival rate was documented the following summer. One of the parent populations had declined to 8 surviving individuals before the seedling transplants, but this population is now up to 33 plants. Additional seeds have been collected and are being stored by the North Carolina Arboretum, a member garden of the Center for Plant Conservation.

E. La Verne Smith

Current Recovery Needs: Needed recovery actions include refining the use of fire to stimulate growth and reproduction, controlling recreational use of the most important habitat, and continuing seed collection and reintroduction of propagules into declining populations or at sites where the plants have been eliminated. Continued monitoring of all populations is also necessary.

Section 6 Funding and Activities: In FY 1992, the North Carolina Department of Agriculture's Plant Conservation Program received $7,883 to monitor and manage the mountain golden heather at all occupied sites.

Partnerships

Forest Service: The Forest Service has management responsibility for the remaining mountain golden heather sites. In cooperation with the Fish and Wildlife Service and the North Carolina Department of Agriculture's Plant Conservation Program, the Forest Service has carried out prescribed burns for the benefit of mountain golden heather and partially funded ongoing monitoring activities.

North Carolina Department of Agriculture's Plant Conservation Program: In addition to its section 6 activities, the Department has cooperated with the Service to establish permanent plots for this species, carry out annual monitoring, collect seeds and arrange for propagation and reintroduction of seedlings back into the wild, and provide technical assistance on prescribed burns.

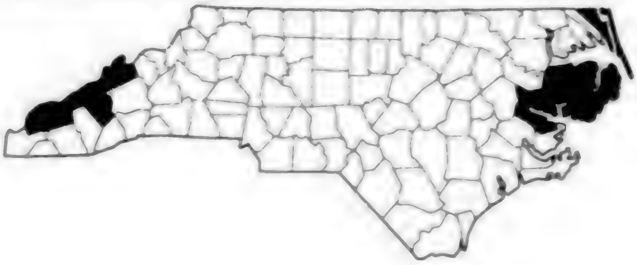
North Carolina Arboretum: The North Carolina Arboretum has begun seed collection and propagation for the mountain golden heather.

Recovery Plan Status: Plan approved 9/14/83.

North Carolina

Red Wolf

(*Canis rufus*)—Endangered

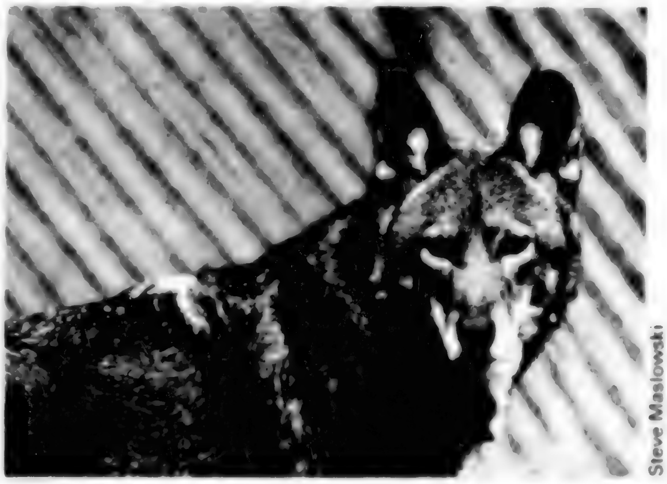


Current Status:

Current Status: Overall, the red wolf population stands at about 196 individuals, which includes captive animals. In North Carolina, the wild population at Alligator River National Wildlife Refuge contains approximately 32 animals. The red wolf continues to face threats resulting from misperceptions about wolves. Certain attitudes could hinder further reintroductions and result in the unnecessary taking of wolves.

Achievements: Additional wolf releases and wild reproduction at Alligator River National Wildlife Refuge have increased the wild population. The first second-generation young were produced in the wild in 1991. The refuge also supports the second largest red wolf captive breeding program, which consists of 18 animals. Meetings were held with the County Board of Commissioners in Dare, Tyrrell, Washington, Hyde, and Beaufort Counties, the areas designated for additional wolf reintroduction as a nonessential experimental population. Eight public meetings were also held. At these meetings, the results of the first 5 years of the wolf reintroduction project were presented as well as a proposal to expand the project westward by releasing one to two family groups at the Pocosin Lakes National Wildlife Refuge in 1993 as part of the Alligator River National Wildlife Refuge experimental population. Another reintroduction effort was launched at Great Smoky Mountains National Park in Tennessee in 1991. This population stands at nine animals. There are also three island propagation projects at Bulls Island, South Carolina, St. Vincent Island, Florida, and Horn Island, Mississippi, consisting of four adult wolves. About 156 wolves are located in 30 captive breeding facilities across the Nation, which include the island propagation projects. The first artificial insemination has been achieved.

Current Recovery Needs: An expansion of the Alligator River population westward would increase the amount of habitat available for dispersing animals and help increase the population to a level less likely to be eliminated by catastrophic events. The current reintroduced population will continue to receive close monitoring, and problem animals will be dealt with immediately.



Steve Maslowski

Partnerships

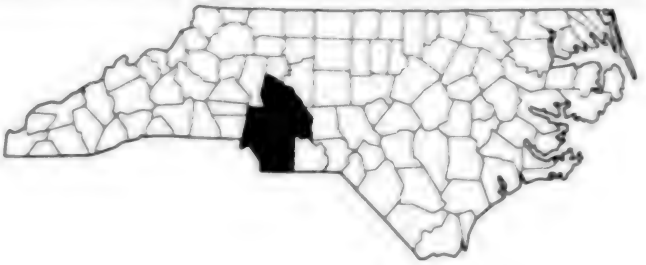
North Carolina Wildlife Resources Agency: This State agency worked with the Fish and Wildlife Service on the Alligator River reintroduction in 1987. The Service will request this agency's approval to expand the project westward to the Pocosin Lakes National Wildlife Refuge.

North Carolina Life and Science Museum: This facility, located in Durham, recently entered the captive breeding program and houses an adult pair of red wolves.

Western North Carolina Nature Center: This facility, located in Asheville, became a captive breeding cooperator in 1992 and has an adult pair of red wolves.

Recovery Plan Status: Original plan approved 7/12/82; revised 10/26/90.

North Carolina



Schweinitz's Sunflower

(*Helianthus schweinitzii*)—Endangered

Current Status: Only 12 populations of Schweinitz's sunflower remain in North Carolina. Threats to the species include destruction or degradation of its habitat due to residential and industrial development, mining, encroachment by exotic vegetation, highway construction and improvement, roadside and utility right-of-way maintenance, and loss of natural disturbance from fire and native herbivores. Approximately two-thirds of the remaining populations are on roadsides or utility line rights-of-way, where they are vulnerable to accidental destruction.

Achievements: The Nature Conservancy has purchased one site and part of another where the species occurs, and is currently managing the sites with prescribed burning. The Nature Conservancy has signed a management agreement with the owners of a third site, securing at least temporary protection. Cutting of competing woody vegetation began at this site in 1992 and will be followed by prescribed burning in 1993, along with continued monitoring. The Fish and Wildlife Service and the North Carolina Natural Heritage Program initiated a cooperative effort with the North Carolina Department of Transportation to prevent mowing or grading of roadside populations during the plant's reproductive period. Although initial attempts were unsuccessful, efforts to prevent inadvertent mowing have doubled, and explicit signs have been posted at the boundaries of all roadside populations. An informal section 7 consultation is under way with the Federal Highway Administration on the widening of State Highway 16 near Charlotte, where the species

FWS File Photo

occurs on the right-of-way. In addition, seed is being collected by the North Carolina Botanical Garden from all North Carolina populations.

Current Recovery Needs: Necessary recovery actions include continued use of growing season burns to stimulate growth and reproduction, continued seed collection and reintroduction of propagules, and continued monitoring of all populations.

Section 6 Funding and Activities: In FY 1991, the North Carolina Department of Agriculture's Plant Conservation Program received $5,000 to monitor, manage, and protect Schweinitz's sunflower at all occupied sites in the State.

Partnerships

North Carolina Department of Agriculture's Plant Conservation Program: In addition to its section 6 activities, the Department has carried out annual monitoring and provided technical assistance on management.

North Carolina Natural Heritage Program: This agency, in cooperation with the Fish and Wildlife Service, The Nature Conservancy, and the North Carolina Department of Agriculture's Plant Conservation Program, has carried out annual monitoring and provided technical assistance on management. The North Carolina Natural Heritage Program has also developed a draft recovery plan for the species, under contract with the Service.

North Carolina Department of Transportation: In cooperation with the Fish and Wildlife Service and the North Carolina Natural Heritage Program, this agency has posted roadside populations of this sunflower to prevent mowing or grading during the species' reproductive season.

The Nature Conservancy: The Conservancy has purchased one site and part of another for this species, and has negotiated a management agreement with the landowners of a third. The sites are being managed by cutting and controlled burning.

University of North Carolina at Charlotte: Botanists with the University are assisting with monitoring and management of the species at North Carolina sites.

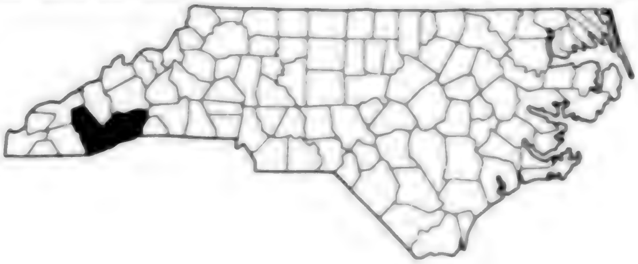
Duke Power Company and Carolina Power and Light Company: These utility companies are working with conservation agencies to protect populations located on rights-of-way.

North Carolina Botanical Garden: The North Carolina Botanical Garden has begun seed collection and propagation for Schweinitz's sunflower.

Recovery Plan Status: Technical draft plan.

Swamp Pink

(*Helonias bullata*)—Threatened



Current Status: Development leading to the degradation of wetlands in which this wildflower occurs is the primary threat to its survival.

Achievements: Since its listing in 1988, several new populations have been found at the northern and southern portions of the species' range. Most notable is the 1991 discovery of a spruce bog population consisting of at least 100,000 plants on Forest Service land. This important discovery resulted from an informal section 7 consultation on a proposed Forest Service visitor center. The Forest Service revised preliminary development plans in order to avoid the swamp pink site. Monitoring plots have been established within colonies adjacent to the visitor center and within the undisturbed population outside of the impact area.

David Snyder

Current Recovery Needs: Further site evaluations, completion of searches for additional sites, habitat protection, public information programs, and investigations of genetic variability, population dynamics, and habitat needs are identified in the recovery plan.

Partnerships

National Park Service: University of Georgia researchers have used National Park Service funding to complete preliminary genetic analyses.

Forest Service: This Federal agency is monitoring populations on its lands and has agreed to divert development from known populations.

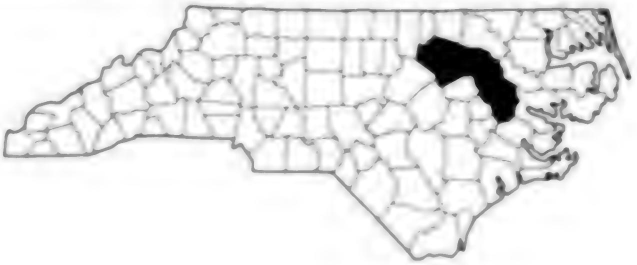
North Carolina Department of Agriculture's Plant Conservation Program: The Department is cooperating with The Nature Conservancy and the Fish and Wildlife Service to protect swamp pink habitat.

The Nature Conservancy: The State chapter is negotiating to acquire a Henderson County site that supports, in addition to swamp pink, the endangered bunched arrowhead (*Sagittaria fasciculata*). The endangered mountain sweet pitcher plant (*Sarracenia rubra* spp. *jonesii*) also grew there historically, as did a listing candidate, the white fringeless orchid (*Platanthera integrilabia*).

Recovery Plan Status: Plan approved 9/30/91.

Tar River Spinymussel

(*Elliptio steinstansana*)—Endangered



Current Status: The Tar River spinymussel faces water quality degradation resulting from industrial and sewage effluents and the runoff of silt and other water pollutants from poorly designed construction, development, mining, agricultural, and forestry activities.

Achievements: During the past 2 years, a new population was discovered in a tributary of the Tar River, an analysis of threats to the species was completed, and the Fish and Wildlife Service published a revised recovery plan. Although little measurable progress has been made thus far in recovering the mussel or stabilizing existing populations, efforts that should begin to improve recovery prospects are now under way.

Current Recovery Needs: Recovery will require continued protection and enhancement of existing populations, and the protection of currently occupied and historic habitat. Methods for reintroducing the species into unoccupied historic habitat and for cryopreservation of genetic material are needed. An investigation of the potential threat from an invasion of the exotic zebra mussel is important, and the public must be informed of the plight of this and other endangered mussels.

Section 6 Funding and Activities: In FY 1991, the North Carolina Wildlife Resources Commission was provided $23,000 to monitor this species, identify its habitat requirements, and evaluate threats to its survival. In FY 1992, the Commission was provided $5,000 for additional surveys and monitoring, and for life history studies of the spinymussel.

Partnerships

Tennessee Valley Authority: This agency conducts mussel surveys as part of its environmental review of projects that may impact mussel populations, maintains a geographic data base on mussel distribution, is developing mussel propagation technology, and has conducted a bioassay of various chemicals using juvenile mussels. The Tennessee Valley Authority is also developing feeding and holding procedures for artificially propagated juvenile mussels.

Dick Biggins

North Carolina Wildlife Resources Commission: This State agency is responsible for managing North Carolina's federally listed mussels, including the Tar River spinymussel. The Commission has an environmental review process and makes site surveys. Commission biologists discovered a new population of the species and have analyzed threats to existing populations. The Commission is also attempting to secure greater State protection for the habitats of the spinymussel and other listed mussels.

North Carolina Department of Environment, Health and Natural Resources: This State agency is responsible for maintaining a geographic data base on the distribution of mussels. Through maintenance of the data base, this agency provides valuable information for environmental review of projects that may affect mussels.

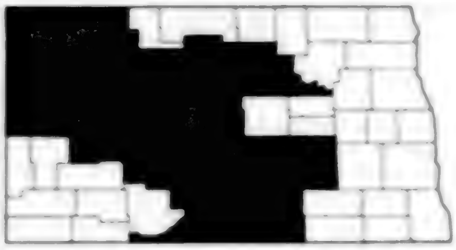
Recovery Plan Status: Original plan approved 1/16/87; revised 5/5/92.

North Dakota

Species Name	*Status*
Ferret, black-footed	E
Crane, whooping	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, least (interior population)	E
Sturgeon, pallid	E
Orchid, western prairie fringed	T

North Dakota

Interior Shorebirds



Species:
Least Tern (Interior Population) (*Sterna antillarum*)—Endangered
Piping Plover (*Charadrius melodus*)—Threatened

Current Status: Habitat quality continues to diminish without the natural replacement that used to occur under the natural spring flooding regime in the major river systems. Predation, flooding of nests by inappropriately timed dam releases, weather extremes, contaminants, and human disturbance have become more significant due to degraded habitat.

Achievements: The Fish and Wildlife Service has worked with the Army Corps of Engineers (Corps) on Missouri River flow releases to reduce nest loss due to flooding caused by irregular dam releases during the nesting season and to create additional habitat. The Corps has been implementing actions connected with a jeopardy biological opinion on impacts to least terns and piping plovers from the Corps' Missouri River main stem system operations, but has failed to provide sufficient protection to achieve the required fledging ratios needed to preclude jeopardy as described in the biological opinion. However, the Corps has made changes in its operations that have significantly reduced flooding of nests and has formed a Tern and Plover Management Team in response to the reasonable and prudent alternatives of the biological opinion. Other section 7 activities have included consultations on section 404 (Clean Water Act) and section 10 (Rivers and Harbors Act) permits, resulting in increased avoidance of impacts (i.e., flooding of nests and destruction of nesting habitat) to terns and plovers. In addition, an active information and education campaign has reduced human disturbance to nesting colonies. Nest cages to reduce plover nest predation have helped to increase nest success. Private landowner agreements to protect plover nesting habitat in prairie wetlands in the Missouri Couteau have been secured, and habitat enhancement techniques continue to improve.

Current Recovery Needs: Stemming the loss of nesting habitat is the highest priority, as well as improving habitat and reducing predation and human disturbance. However, increasing habitat may not be the entire answer, and more drastic measures, such as captive propagation and release, may be required. Rangewide monitoring is needed to determine population status. Actions addressing predation are also necessary.

Section 6 Funding and Activities: The North Dakota Game and Fish Department used $18,000 in FY 1992 to conduct a population census of the Missouri River, main stem reservoirs, and prairie wetlands; work with the Department of Agriculture and Environmental Protection Agency to update the Pesticide Labeling Program; conduct educational activities; and coordinate with the State Water Commission and State Engineer to assist with Missouri River habitat enhancement.

Luther C. Goldman

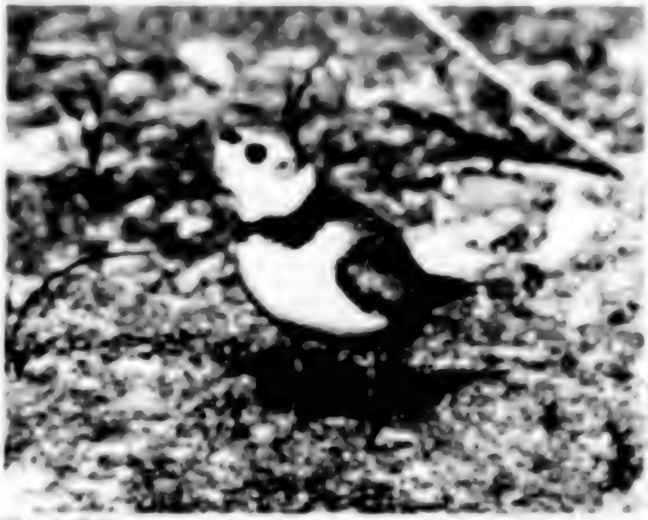
Least Tern (Interior Population)

Partnerships

Army Corps of Engineers, Bureau of Land Management, and Bureau of Reclamation: These agencies are responsible for carrying out a number of tasks under the recovery plans, including assisting with population surveys, evaluating breeding habitat and threats, reducing human disturbance, managing water levels, developing a river management plan, and conducting public education. Although some of these tasks have been partially carried out, many still need to be implemented.

North Dakota Game and Fish Department: The Department assists the Federal agencies with the activities listed above.

The Nature Conservancy: The Conservancy conducts population surveys; evaluates breeding habitat, threats, and predator impacts; develops habitat protection criteria; and provides public education.



James P. Mattsson

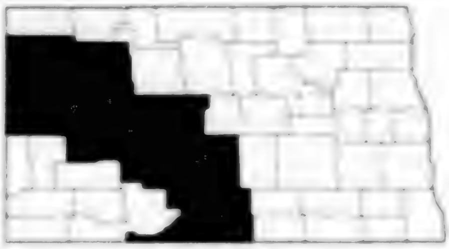
Piping Plover

Recovery Plan Status:

Interior least tern—plan approved 9/19/90

Piping plover—plan approved 5/12/88.

North Dakota



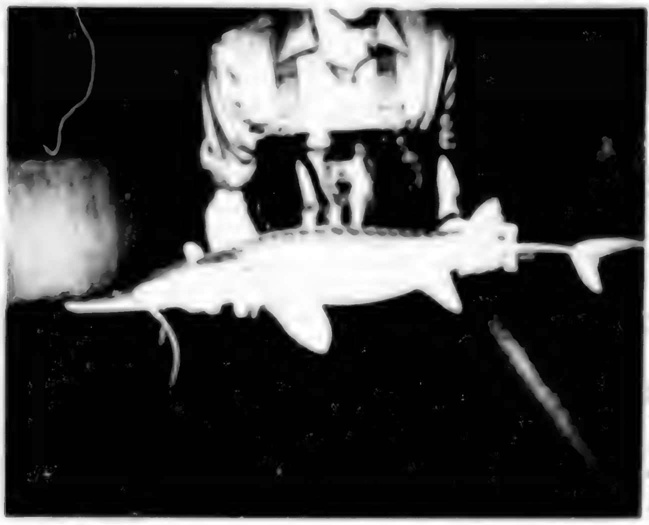
Pallid Sturgeon

(*Scaphirhynchus albus*)—Endangered

Current Status: Missouri River dams, bank stabilization and channel containment measures, and pollution have severely altered pallid sturgeon habitat. Years of effort will be required for restoration. In the meantime, accidental take of the species through sport and commercial fishing must be reduced to avoid extinction.

Achievements: Pallid sturgeon are extremely rare. Only remnant populations of aging adults remain in the Missouri River. In the Mississippi River, hybridization with the shovelnose sturgeon appears common. The pallid sturgeon's potential to adapt to captivity was unknown until broodstock collected from both river systems adapted to conditions in a South Dakota Federal hatchery and a Missouri State hatchery. During the spring of 1992, two females were successfully spawned in the Missouri hatchery. Results indicate hatcheries can supplement wild stocks as habitats are restored. Research on rearing requirements for the progeny answered many important questions related to diet, appropriate density levels in captivity, growth rates, and development characteristics.

Research to determine habitat preferences and adult pallid sturgeon movements is being coordinated between the Fish and Wildlife Service's Montana and South Dakota Cooperative Fish and Wildlife Research Units, and the State's fishery departments. South Dakota, North Dakota, and Louisiana have closed sport and commercial fishing seasons to protect against incidental take. Aquariums in North Dakota, Nebraska, Missouri, and Louisiana are receiving progeny from the successful spawn in Missouri to increase public awareness.



Jim Rathert, Missouri Department of Conservation

Section 7 consultations were conducted on sand and gravel dredging with the Army Corps of Engineers and on bridge constructions with the Federal Highway Administration. No-jeopardy biological opinions were made as a result of successful negotiations during informal consultations.

Current Recovery Needs: Recovery needs include obtaining broodstock, evaluating life requirements, researching threats, and rehabilitating habitat.

Section 6 Funding and Activities: The North Dakota Game and Fish Department received $20,000 in FY 1991 and $18,000 in FY 1992 to research habitat needs, assist with planning, and implement public outreach.

Partnerships

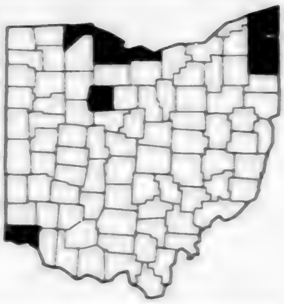
North Dakota Game and Fish Department: The Department is undertaking outreach activities and has closed its sturgeon fishing seasons.

State of Missouri: A hatchery operated by the State of Missouri has successfully spawned pallid sturgeon for use in reintroduction efforts.

Recovery Plan Status: Agency draft plan

Ohio

Species Name	*Status*
Bat, Indiana	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	E
Madtom, Scioto	E
Fanshell	E
Pearly mussel, pink mucket	E
Pearly mussel, white cat's paw	E
Clover, running buffalo	E
Daisy, lakeside	T
Monkshood, northern wild	T
Orchid, eastern prairie fringed	T



Bald Eagle

(*Haliaeetus leucocephalus*)—Endangered

Current Status: Although bald eagle numbers continue to grow nationwide, the loss of a high percentage of Ohio nestlings in 1990 and 1991, including all nestlings being fed from Lake Erie proper, suggests a problem with contaminants in the Lake Erie food chain. In 1991, at least 19 bald eagle nesting territories only produced an estimated 0.32 young per occupied territory. Ongoing Ohio studies also show that most post-fledging eagles densely congregate in the few remaining remote areas near the Lake Erie shoreline. These young birds are much less tolerant of human activity than adults. Additionally, bald eagles continue to suffer from shooting, trapping, poisoning, and collisions with, and electrocution by, powerlines.

Achievements: Despite the losses described above, the overall number of occupied nesting territories and successful fledgings in Ohio has increased over the past 3 years. Young eagles are being studied to determine movements and habitat preferences. Also, unhatched eggs, dead eagles, and prey items continue to be collected and analyzed for contaminants. The Army Corps of Engineers is helping to maintain suitable habitat for eagles around its reservoirs, and the Ohio Department of Natural Resources is leading the eagle recovery program in the State.

FWS File Photo

Current Recovery Needs: Nesting, post-fledging, migratory, and wintering habitat will need long-term protection. Contaminant levels in eagle prey will need to be reduced, as well as mortality from powerlines and illegal shooting, poisoning, and trapping.

Partnerships

Army Corps of Engineers: Although no eagle nests are located on Corps reservoirs in Ohio, eagles use these reservoirs for foraging. The Corps is cooperating with the Ohio Department of Natural Resources to maintain suitable habitat for eagles around its reservoirs.

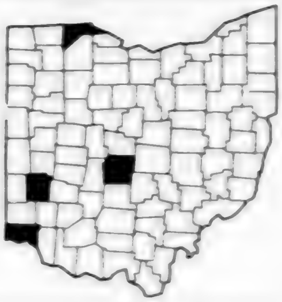
Ohio Department of Natural Resources: The Department leads the eagle recovery program in Ohio. It is continuing to protect eagle nesting areas, monitor active nests, rescue sick and injured eagles, and study the movements and habitat needs of young eagles.

City of Akron: An eagle nest has been located at a reservoir owned by the city of Akron, and the city is cooperating with the Ohio Department of Natural Resources to protect the eagles from excessive disturbance and habitat degradation.

Recovery Plan Status: Plan approved 7/29/83.

Peregrine Falcon

(*Falco peregrinus*)—Endangered



Current Status: Current trends in nesting peregrine falcons indicate that the recovery goal of 20-25 breeding pairs in the Great Lakes Recovery Region may be reached in the next decade. Although there is concern that environmental contaminants could cause decreases in reproduction and increases in mortality, there is little evidence that such problems exist now. Predation on nestlings, fledglings, and adult falcons by great horned owls and raccoons has been significant at some historic eyries, making them unsuitable as hacking sites

FWS File Photo

Achievements: Fourteen peregrine falcons were hacked in Ohio in 1991 and seven in 1992. The State is winding down its hacking program because of the growing population of peregrines in the wild. One successful peregrine nesting occurred in Toledo in 1991, with the fledging of a single falcon. In 1992, the same nest produced two fledglings. During these years, another pair was active in Cleveland but did not reproduce. Additional peregrine pairs established territories in Dayton and Cincinnati in 1992, and will likely nest in 1993.

Current Recovery Needs: The peregrine falcon will need continued monitoring in Ohio to detect problems with contaminants, predation, and low genetic variability. Additionally, individual falcons and their nest sites will need continued protection.

Partnerships

Ohio Department of Natural Resources: This State agency leads the peregrine falcon recovery program in Ohio, including the hacking program mentioned above.

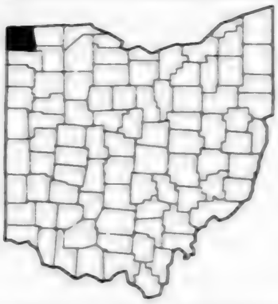
The Raptor Center at the University of Minnesota, St. Paul Campus: The Raptor Center has coordinated peregrine falcon reintroduction efforts in Ohio and throughout the Midwest.

Recovery Plan Status: Original plan approved 8/20/79; revised 9/27/91.

Ohio

White Cat's Paw Pearly Mussel

(*Epioblasma sulcata delicata*)—Endangered



Current Status: Adjacent land use practices have led to water quality degradation. Bridge and road construction, along with stream "cleaning" (i.e., clearing snags and detritus from stream), also have destroyed mussel habitat. The absence of the host fish during the species' parasitic larval stage may be another factor connected with the decline.

Achievements: A multi-agency watershed protection program has been developed during the past 2 years to prevent water quality degradation in Fish Creek, where the sole population of white cat's paw pearly mussel occurs alongside the clubshell mussel (*Pleurobema clava*), which has been proposed for listing as endangered. The program aims to advise landowners about adverse impacts of certain land use practices in the watershed and the availability of alternatives for preserving water quality as well as land productivity. The first agreements with landowners are for planting woody vegetation buffers, using Federal Cropland Reserve Program and State funding. As a member of this multi-agency group, the Fish and Wildlife Service is securing through landowner agreements viable populations of mussels and other aquatic species in Indiana, Ohio, and Michigan that are either listed or are candidates for listing.

Current Recovery Needs: Improving water quality, monitoring the viability of existing populations, locating new populations, and carrying out life history studies to better protect and manage endangered mussels are necessary.

Kevin S. Cummings

Partnerships

Soil Conservation Service: This Federal agency is a partner in the Fish Creek Restoration Plan, with responsibility for reducing run-off and soil erosion, through economic agricultural conservation practices, to levels below the threshold for harm to fish and mussel species.

Ohio Department of Natural Resources: Also a partner in the Fish Creek Restoration Plan, the Ohio Department of Natural Resources is responsible for securing viable populations of listed or candidate mussel, fish, insect, and other aquatic species in Indiana, Ohio, and Michigan.

Indiana Department of Natural Resources: In addition to cooperating with the Ohio Department of Natural Resources and the Soil Conservation Service, the Indiana Department of Natural Resources is working to secure $1.5 million to cover protection and operation costs for the first 10 years of the Fish Creek Restoration Project.

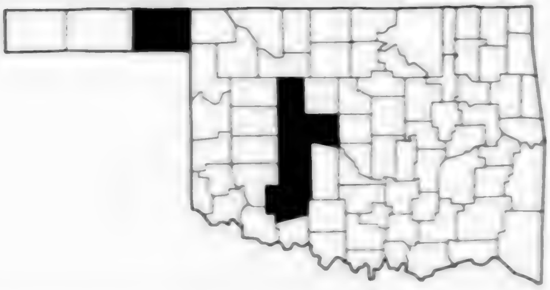
The Nature Conservancy: As part of the multi-agency partnership, the Conservancy is developing a cooperative Fish Creek protection group that includes citizens; private organizations; local, State, and Federal officials; and representatives from the agricultural community. The Conservancy is also helping to secure the $1.5 million for protection and operation costs.

Recovery Plan Status: Plan approved 1/25/90.

Oklahoma

Species Name	*Status*
Bat, gray	E
Bat, Indiana	E
Bat, Ozark big-eared	E
Crane, whooping	E
Curlew, Eskimo	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, least (interior population)	E
Vireo, black-capped	E
Woodpecker, red-cockaded	E
Cavefish, Ozark	T
Darter, leopard	T
Madtom, Neosho	T
Mussel, Ouachita rock-pocketbook (Wheeler's pearlymussel)	E
Beetle, American burying (=giant carrion)	E
Orchid, western prairie fringed	T

Oklahoma



Black-capped Vireo

(*Vireo atricapillus*)—Endangered

Current Status: Major threats to the species in Oklahoma are nest parasitism by brown-headed cowbirds and habitat loss. Nest predation by other birds, snakes, and mammals contributes to the low reproductive success. Habitat fragmentation reduces the possibilities for dispersal as occupied areas become unsuitable. Other threats are posed by human disturbance and pesticide use in some areas.

Achievements: The habitats of all known Oklahoma populations are protected because of their location on Federal lands (Fort Sill and Wichita Mountains National Wildlife Refuge) and on private land protected by voluntary agreements with The Nature Conservancy. Cowbird control has been initiated at all known breeding areas. Management plans are being developed for the vireo on Federal lands. Additional territories have been found on private lands as a result of increased surveys. Informal section 7 consultations have been completed for a number of Federal activities, including a highway reconstruction project, and no adverse impacts to vireos were found. The vireo population at the Wichita Mountains National Wildlife Refuge (about 250 adults in 1991) has shown growth.

Current Recovery Needs: Actions necessary to recover the species include cowbird control, continued monitoring of vireo populations, and habitat restoration and management. Research needs include examining the biology/ecology of vireos on their wintering grounds, determining the effects of nest predators on reproductive success, and defining habitat requirements.

Section 6 Funding and Activities: The Oklahoma Department of Wildlife Conservation received $4,000 in FY 1991 and $6,000 in FY 1992 to survey black-capped vireo breeding sites in Oklahoma, provide limited control of cowbird nest parasitism, and assess black-capped vireo production and recruitment in Oklahoma.

Alisa Shull

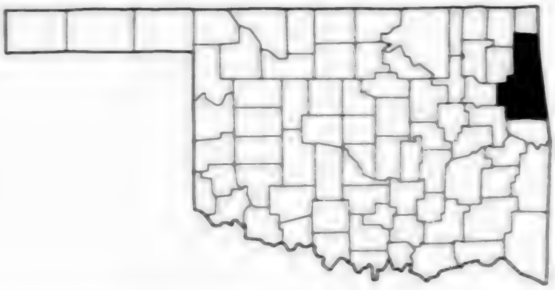
Partnerships

Department of the Army: The Army has maintained and increased usable vireo breeding habitat at Fort Sill, which has resulted in increases in the Wichita Mountains National Wildlife Refuge population. The vireo population at Fort Sill is being monitored; brown-headed cowbird trapping was initiated in 1992. A management plan for Fort Sill has been drafted and is under review.

Oklahoma Department of Wildlife Conservation: The Department has provided funds to The Nature Conservancy for vireo population monitoring and brown-headed cowbird control on private lands in Blaine County.

The Nature Conservancy: The Conservancy has encouraged private landowners to participate in vireo recovery activities, resulting in an increase of adult vireos on private lands from 12 in 1990 to 28 in 1992. It has also monitored vireo populations, surveyed for additional vireos, and assisted in cowbird control and vireo habitat management.

Recovery Plan Status: Plan approved 9/30/91.

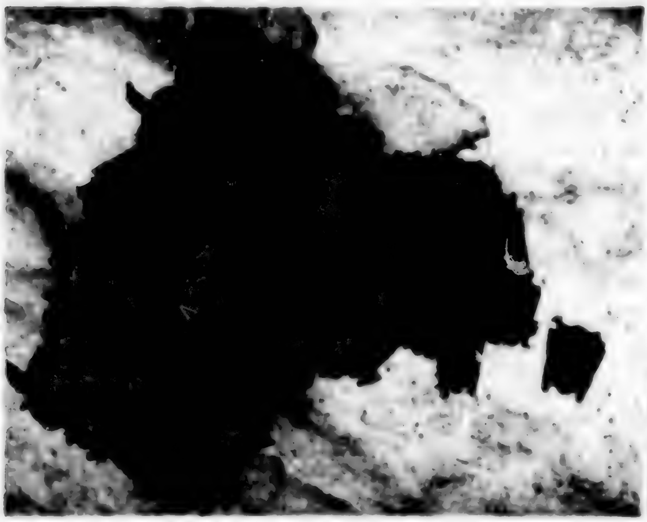


Ozark Big-eared Bat

(*Plecotus townsendii ingens*)—Endangered

Current Status: From 1984 to 1990, the known Oklahoma population increased from about 425 to 1,700, but it declined to about 1,000 by 1992. Some of the increase was due to the discovery of new populations, and the Service believes the decrease may represent movement to other caves. This bat is threatened primarily by its small population size, limited distribution, and intolerance of disturbance. Other threats include habitat loss and the possible effects of pesticides.

Achievements: The Farmers Home Administration transferred land containing caves and foraging habitat to the Oklahoma Bat Caves National Wildlife Refuge. In addition, a management agreement with the Cherokee Nation for 120 acres brought the size of the refuge to 885 acres. The Nature Conservancy is purchasing an important maternity cave and hibernaculum, with surrounding foraging habitat. An important privately owned cave was fenced, and a gate on another cave was repaired. Hibernacula and other new sites were discovered, population monitoring continued, a telemetry study of habitat use began, and work on a recovery plan update proceeded.



Michael J. Harvey

Current Recovery Needs: Recovery needs include habitat protection, public education, searches for new populations, enforcement against take (including disturbance) of endangered bats, cave gating, placement of interpretive/warning signs, studies on effects of contaminants, and continued monitoring of the bats and their habitat.

Section 6 Funding and Activities: The Oklahoma Department of Wildlife Conservation received $29,650 in FY 1991 and $23,650 in FY 1992, and in turn contracted with universities to conduct studies. Oklahoma State University searched for new maternity and hibernation caves and carried out studies of bat movement, habitat use, food habits, cave characteristics, and effects of surrounding land uses. Northeastern State University developed and implemented cave protection plans and landowner agreements for important caves on private land.

Partnerships

Oklahoma Department of Wildlife Conservation: The Department has coordinated the above section 6 projects with Northeastern State University and Oklahoma State University.

The Nature Conservancy: This organization has granted the Fish and Wildlife Service an easement to manage important caves and foraging habitat it owns. The group is purchasing another important cave and will coordinate its management with the Service. The Conservancy also assists the Service in habitat acquisition and management.

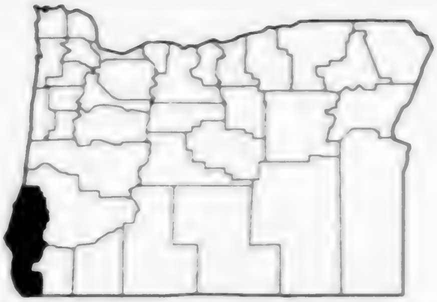
Bat Conservation International: This group has provided information for revision of the recovery plan and will review the draft prior to its completion.

Recovery Plan Status: Plan approved 5/8/84.

Oregon

Species Name	*Status*
Deer, Columbian white-tailed	E
Eagle, bald	T
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Goose, Aleutian Canada	T
Owl, northern spotted	T
Pelican, brown	E
Turtle, green sea	T
Turtle, leatherback sea	E
Turtle, olive (=Pacific) ridley sea	T
Chub, Borax Lake	E
Chub, Hutton tui	T
Dace, Foskett speckled	T
Sucker, Lost River	E
Sucker, short-nose	E
Sucker, Warner	T
Trout, Lahontan cutthroat	T
Butterfly, Oregon silverspot	T
Desert-parsley, Bradshaw's	E
Four-o'clock, MacFarlane's	E
Wire-lettuce, Malheur	E

Oregon



Aleutian Canada Goose

(Branta canadensis leucopareia)—Threatened

Current Status: Winter habitat of Aleutian Canada geese is primarily under private ownership and thus unprotected. Disease, especially avian cholera, and contaminants threaten the species as it becomes concentrated within limited areas. Some illegal hunting still occurs.

Achievements: Geese that nest in the Semidi Islands, Alaska, have responded slowly but steadily to management (i.e., creating short winter grazing habitat) in California and protection from hunting in California and Oregon. Successful management efforts (e.g., control of arctic fox on breeding islands, transplanting geese to new nesting islands, and hunting closures) throughout the species' range resulted in its reclassification from endangered to threatened status in 1990. The population now numbers approximately 7,900 birds, according to the 1991/1992 winter estimate, exceeding the recovery plan goal for delisting. However, delisting has not occurred because objectives for establishing nesting populations in the Aleutian Islands, Alaska, and protecting wintering habitat have not been met.

The Oregon population now numbers approximately 126 birds, primarily as a result of protection from hunting on Tillamook County wintering grounds. The geese were monitored throughout the 1990/1991 and 1991/1992 winter seasons, and all aspects of habitat use were recorded.

Current Recovery Needs: Conservation of the species' winter habitat is the primary recovery need. Monitoring of population size and movements, determining winter habitat requirements, and investigating competition with other Canada goose subspecies also are needed. Cooperative agreements between agency staff and private landowners need to be established to address increasing concern over crop depredations.

Roy Lowe

Partnerships

Bureau of Land Management: This Federal agency is managing migration habitat in south-coastal Oregon for multiple uses, including goose habitat.

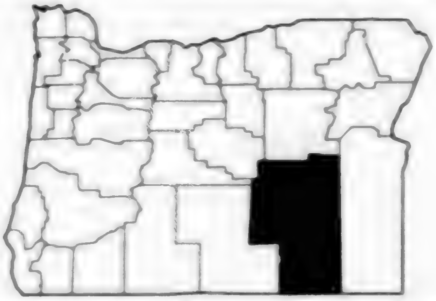
Oregon Department of Fish and Wildlife: The Department maintains hunting closures for Aleutian Canada geese and manages winter habitat on State lands.

Recovery Plan Status: Original plan approved 3/7/79; revised 9/30/91.

Oregon

Borax Lake Chub

(*Gila boraxobius*)—Endangered



Current Status: The current population of this fish is threatened by water temperature and/or water depth changes related to the development of nearby geothermal resources. Also, physical destruction of the spring pool rim by frequent human visitation is a threat; water chemistry analyses have shown that lake conditions no longer support deposition of rim material through chemical precipitation. This could result in lake rim erosion and potentially the loss of the lake.

Achievements: Memoranda of Understanding have been implemented among the Fish and Wildlife Service, The Nature Conservancy, Oregon Department of Fish and Wildlife, and Bureau of Land Management to promote and coordinate research and recovery efforts. Much has been learned about the species through intensive investigation of its biology, habitat, and behavior. The Bureau of Land Management, U.S. Geological Survey, and Portland State University have done extensive geological survey work, helping to define the nature of the threat that might be posed by geothermal development in the area.

Current Recovery Needs: Habitat of the Borax Lake chub is in private ownership and should be secured either through land acquisition or a conservation easement. Additionally, the quantity and quality of water in Borax Lake and its adjacent marshes should be maintained.

Section 6 Funding and Activities: The Oregon Department of Fish and Wildlife received $10,000 in FY 1991 and $20,000 in FY 1992 to study the Borax Lake chub and its habitat.

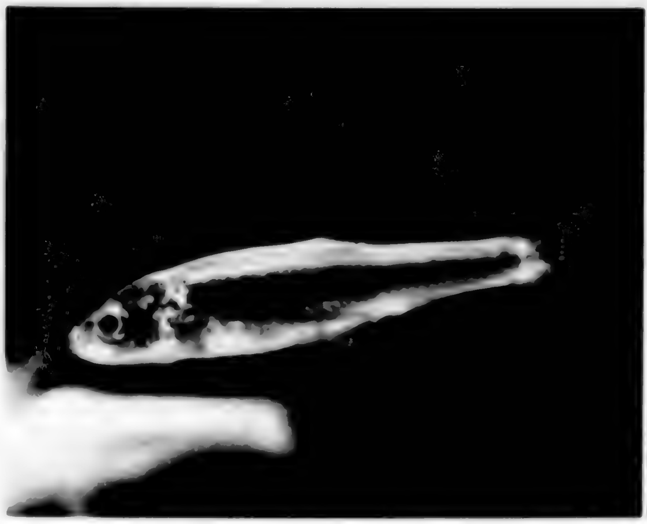
Partnerships

Bureau of Land Management: Through Memoranda of Understanding with The Nature Conservancy and a private landowner, this Federal agency is responsible for protecting the lake and its associated ecosystem. The Bureau has prohibited grazing, vehicle use, shoreline alterations, mining or geothermal exploration, and use of herbicides in or near the critical habitat. The agency is also providing personnel and funding for monitoring.

Oregon Department of Fish and Wildlife: The Borax Lake Chub Recovery Plan requires the Department to curtail water deliveries from Borax Lake, prevent herbicide use within critical habitat, prevent alterations to the lakeshore, monitor physical habitat, monitor fish and invertebrate populations, and evaluate the effectiveness of applicable laws and regulations to protect the species and its habitat. Except for curtailing lake water deliveries, all these requirements have been carried out. Much of this work has been subcontracted out to The Nature Conservancy.

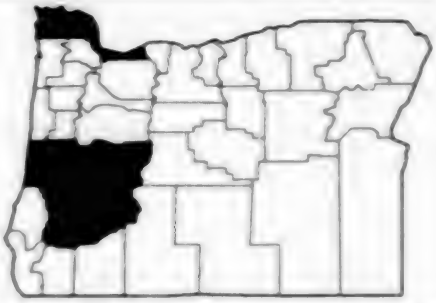
The Nature Conservancy: This private organization, through Memoranda of Understanding, has assisted in protecting Borax Lake and its associated ecosystem.

Recovery Plan Status: Plan approved 2/4/87.



Peter Rissler

Oregon



Columbian White-tailed Deer

(*Odocoileus virginianus leucurus*)—Endangered

Current Status: The major threat to the species is loss of habitat, primarily to residential and agricultural development. Additional threats include predation from coyotes, illegal take, and disease. Some disease may result from high densities of deer in core areas.

Achievements: The Columbian white-tailed deer population in Oregon has increased dramatically, from 300-400 individuals in 1976 to 6,000 to 7,000 in 1992. Its range also has expanded from about 80 square kilometers in 1940 to about 1,200 square kilometers in 1992. Major progress has been made in securing and managing habitat, including establishing the Julia Butler Hanson National Wildlife Refuge along the Lower Columbia River. In Douglas County, where the Oregon population of the deer resides, land use plans and zoning ordinances have been implemented to protect habitat and assist in recovery. The Fish and Wildlife Service is considering reclassifying the deer from endangered to threatened, which should allow greater flexibility in herd management.

Current Recovery Needs: Although deer numbers are now above the numerical goals specified in the recovery plan for delisting, there is not yet enough secure habitat to ensure sustained recovery. Once adequate habitat has been secured, consideration can be given to delisting the species.

Partnerships

Bureau of Land Management: This Federal agency is currently pursuing a land exchange to acquire a 6,600 acre ranch in the core area of the Douglas County population, specifically for securing habitat. The Bureau of Land Management has been working cooperatively with the Fish and Wildlife Service and the Oregon Department of Fish and Wildlife throughout the exchange.

Washington Department of Natural Resources

Bureau of Reclamation: The Bureau of Reclamation has been the lead Federal agency in construction of the proposed Milltown Hill Dam, north of Roseburg, Oregon. One of the mitigation measures identified for the dam is the acquisition of additional habitat for the Douglas County deer population. Douglas County, with cooperation from the Bureau of Reclamation, is in process of fulfilling this mitigation requirement.

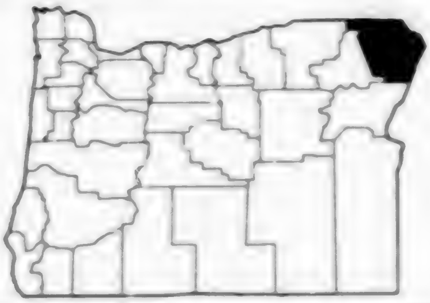
Oregon Department of Fish and Wildlife: This State agency conducts population surveys, enforces hunting restrictions, provides landowners and counties with incentives to secure habitat, conducts research, provides technical assistance to private landowners and State and Federal agencies, and informs the public about the Columbian white-tailed deer. The agency has expended considerable effort in dealing with depredation problems in recent years.

Recovery Plan Status: Original plan approved 10/21/76; revised 6/14/83.

Oregon

MacFarlane's Four-o'clock

(*Mirabilis macfarlanei*)—Endangered



Current Status: The number of known individuals rangewide has increased from about 30 plants when listed in 1979 to about 2,300 plants in 1991. Although drought has resulted in smaller plants, as well as fewer flowers and seeds, four-o'clock colonies do not show major declines. Livestock overgrazing and the weedy invasion of exotic plants it encourages continue to be a problem. Pressure from collectors exists also, especially from those interested in introducing the species into "wild gardens." Indiscriminate herbicide spraying is a threat to plants growing near roadsides.

Achievements: Of the 18 known colonies of MacFarlane's four-o'clock, 4 are in Oregon. The Forest Service has prohibited grazing on MacFarlane's four-o'clock sites after March, when the plant begins to grow. Three of the four sites in Oregon are on public lands. The Forest Service was given permission by the landowner to fence the only privately owned site. The discovery of additional colonies on public lands, better grazing management, and the stability of existing colonies have reduced threats to this species rangewide. As a result, the Fish and Wildlife Service is considering reclassifying the species from endangered to threatened.

Current Recovery Needs: Recovery needs include continued searches for new populations, population monitoring, habitat protection, and further studies on the effects of exotic plant invasions, the impacts of grazing, and the plant's reproductive cycle.

Section 6 Funding and Activities: In FY 1992, the State of Oregon received $8,000 for population trend studies and plant management for work done cooperatively with the Forest Service. Some monitoring work was done on private land as well.

Partnerships

Forest Service and Oregon Department of Agriculture: These agencies, one Federal and one State, have a challenge grant in place to conduct population monitoring on the Wallowa-Whitman National Forest. The Forest Service has also funded research by Boise State University on the chemical effects of cheat grass on the MacFarlane's four-o'clock. The Fish and Wildlife Service assisted in the research design of the project.

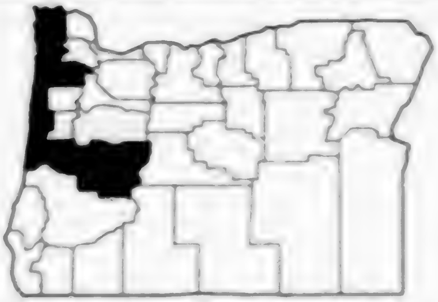
Recovery Plan Status: Plan approved 3/27/85.

Fred Johnson

Oregon

Oregon Silverspot Butterfly

(*Speyeria zerene hippolyta*)—Threatened



Current Status: Three of the six remaining populations of the butterfly are considered secure and in stable condition. Threats to the species include loss or degradation of its open habitat due to woody plant growth, competition from exotic vegetation, fire suppression, and land development.

Achievements: The Oregon silverspot butterfly populations at Mount Hebo, Cascade Head, and Rock Creek, Oregon, have responded favorably to habitat manipulation and are now considered secure. Butterfly habitat at Long Beach (Washington), Del Norte County (California), and Clatsop County (Oregon) is primarily on private lands. The Washington Department of Wildlife is currently securing habitat at Long Beach. At Clatsop Plains, the Fish and Wildlife Service is consulting with the Oregon Military Department to develop a habitat management plan for Camp Rilea. A section 7 consultation with the Federal Highway Administration on a bridge replacement project resulted in a biological opinion that the project, as planned, would jeopardize the butterfly. The adoption of a reasonable and prudent alternative to secure and manage 15 acres of habitat in the Central Coast area will allow the bridge replacement work to proceed. The Oregon Department of Transportation is still identifying the area to secure.

Current Recovery Needs: A revised recovery plan is needed, along with secured habitat, long-term habitat management, and continued monitoring.

Section 6 Funding and Activities: In FY 1992, the Oregon Natural Heritage Program was provided $14,000 to map current and potential habitat of the Oregon silverspot butterfly and to develop monitoring guidelines. Additionally, the Oregon Natural Heritage Program was provided $6,000 for habitat improvement on Oregon's Clatsop Plains.

Partnerships

Forest Service: Since 1980, the Forest Service has managed four areas of Oregon silverspot butterfly habitat in the Siuslaw National Forest. Butterfly larvae were raised in captivity by an entomologist and released at Fairview Mountain in 1991. Since the release, adults have been observed in small numbers.

Oregon Natural Heritage Program: This State program is developing a generic conservation agreement that may be used with private landowners who are willing to participate in butterfly recovery activities or permit recovery activities on their lands. The State is also mapping habitat in Oregon with section 6 funding.

The Nature Conservancy: This private organization has conducted research on the silverspot butterfly and its habitat for many years.

Recovery Plan Status: Plan approved 9/22/82.

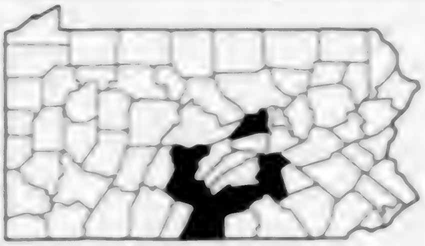
David McConkie

Pennsylvania

Species Name	*Status*
Bat, Indiana	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	E
Fanshell	E
Mussel, ring pink (=golf stick pearly)	E
Beetle, northeastern beach tiger	T
Bulrush, northeastern (=barbed bristle)	E
Pogonia, small whorled	E
Spiraea, Virginia	T

Northeastern Bulrush

(*Scirpus ancistrochaetus*)—Endangered



Current Status: The most serious threats to the northeastern bulrush are the draining, dredging, and filling of its wetland habitat for development, agriculture, and recreation. Additional threats include point and non-point source pollution, natural succession, and herbivory.

Achievements: A draft recovery plan for this species is undergoing public review, and the final plan should be completed in 1993. Listing has focused attention on this rare wetland species, leading to the discovery of seven additional populations in the State. Also, botanists are intensively monitoring a few populations to gain necessary information on the species' life history and habitat requirements.

Current Recovery Needs: Prevailing recovery needs include protection for known populations and their habitat, and searches for additional populations. Protection will require frequent contacts between the Fish and Wildlife Service, the Army Corps of Engineers, and the appropriate State agencies charged with regulating wetlands and endangered species to ensure that existing Federal and State laws and regulations are implemented. Protection may also include land acquisition and conservation easements. Because little is known about the ecology and life history of this species, studies must be conducted to determine habitat requirements, life history, reproductive strategy, and genetic variability.

Judy Jacobs

Section 6 Funding and Activities: In both FY 1991 and FY 1992, the Pennsylvania Bureau of Forestry received $3,000 to monitor known populations and identify potential habitat using aerial photographs, soil surveys, and geological maps.

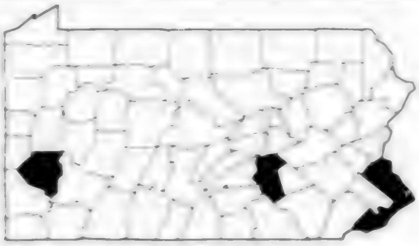
Partnerships

Pennsylvania Bureau of Forestry: This State agency is monitoring existing populations annually and conducting surveys for additional populations.

The Nature Conservancy: With $1,600 provided by the Fish and Wildlife Service, the Conservancy conducted field searches in Pennsylvania and located seven previously unknown populations. The Conservancy is also pursuing conservation easements to protect bulrush populations on private property.

Recovery Plan Status: Technical/Agency draft plan.

Pennsylvania



Peregrine Falcon

(*Falco peregrinus*)—Endangered

Current Status: Rangewide threats to the species include human disturbance of nesting sites, habitat modification, and occasional incidence of poor productivity due to high levels of DDE (a breakdown product of the pesticide DDT) in eggshells.

Achievements: Pennsylvania currently has seven nesting pairs of peregrines, with all nests located on either buildings or bridges. Reproductive success appears to be improving gradually; an average of 1.5 young per active nest is higher than past rates of less than 1.0 young per nest. Most young were banded in 1992 using a new color scheme developed to track the reestablished population.

Current Recovery Needs: Necessary recovery actions include continued surveys for new eyries, habitat protection, contaminant analysis, and public outreach.

Section 6 Funding and Activities: In both FY 1991 and FY 1992, the Pennsylvania Game Commission received $3,000 for population monitoring, nest manipulation (FY 1992 only), eyrie searches, and banding.

Partnerships

Pennsylvania Game Commission: During 1992, the Commission worked with a peregrine pair that had a history of losing young to trichomoniasis, a disease carried by pigeons that can be fatal to young peregrines. The pair was double clutched. Four eggs were artificially incubated from the first clutch, three hatched, and two were successfully hacked. From the second clutch, two young fledged from the eyrie.

Recovery Plan Status: Original plan approved 8/20/79; revised 9/27/91.

FWS File Photo

Rhode Island

Species Name	*Status*
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, roseate	E
Turtle, hawksbill sea (=carey)	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Beetle, American burying (=giant carrion)	E
Beetle, northeastern beach tiger	T
Gerardia, sandplain	E
Pogonia, small whorled	E

American Burying Beetle

(*Nicrophorus americanus*)—Endangered

Current Status: This insect is vulnerable to extinction primarily because of a drastic reduction in range. Historically, the species' range covered 35 States and 3 Canadian Provinces. Currently, however, populations are known to occur in only three or perhaps four States.

Achievements: A protocol has been developed for monitoring the American burying beetle population on Block Island, where a stable population of about 300 to 500 individuals are located. A favorable working relationship has been established between landowners (i.e., Rhode Island Audubon Society, The Nature Conservancy, and private residents) and State and Federal agencies involved in recovery efforts for the species. In 1992, a small number of beetles were found to occur in undeveloped habitat at the Block Island airport. Since the airport is subject to Federal Aviation Administration oversight, the Fish and Wildlife Service will consult with this agency in efforts to protect its habitat. One formal section 7 consultation occurred with the U.S. Marshal Service regarding the seizure and proposed disposition of beetle habitat on Block Island. The no-jeopardy opinion included measures to minimize the incidental take of beetles.

The greatest recovery achievement for this species in the past 2 years has been the greatly expanded survey efforts in the Midwest, and the resulting discovery of beetles in eastern Oklahoma and western Arkansas. A few specimens have also been observed in north-central Nebraska. With these populations, the species appears to be more secure than at the time of listing.

Current Recovery Needs: Necessary recovery actions include reestablishment of populations within the beetle's former range, conducting surveys for additional populations, monitoring and protecting any newly discovered populations, identifying potential reintroduction sites, and completing genetic studies. Since the population on Block Island is one of only two known locations for the species east of the Mississippi River, annual monitoring of that population is essential. In addition, captive populations derived of these animals should be maintained for use in additional reintroduction efforts.

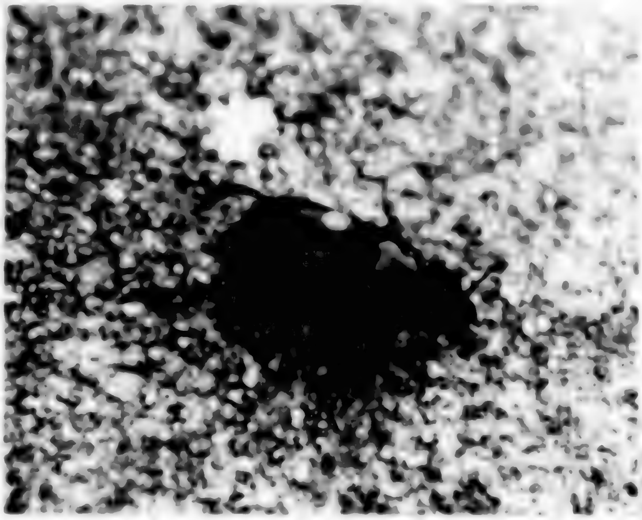
Section 6 Funding and Activities: The Rhode Island Division of Fish and Wildlife received $3,000 in FY 1991 and $4,000 in FY 1992 to monitor the Block Island population, conduct surveys at other sites, complete the recovery plan, and consult with others across the historic range of the species regarding recovery recommendations outlined in the recovery plan.

Partnerships

Rhode Island Division of Fish and Wildlife: Division personnel have been diligent in their efforts for this species, even donating personal time to conduct surveys. They also serve as an information source for others interested in surveying for or restoring beetle populations.

Boston University: The University is conducting a genetic analysis of Rhode Island beetles and prepared a captive breeding protocol for the species.

Recovery Plan Status: Plan approved 9/27/91.



FWS File Photo

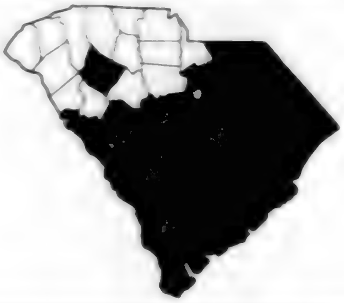
South Carolina

Species Name	*Status*
Bat, Indiana	E
Manatee, West Indian (=Florida)	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Stork, wood	E
Woodpecker, red-cockaded	E
Snake, eastern indigo	T
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, Kemp's (=Atlantic) ridley sea	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Amphianthus, little	T
Arrowhead, bunched	E
Chaffseed, American	E
Dropwort, Canby's	E
Gooseberry, Miccosukee	T
Harperella	E
Heartleaf, dwarf-flowered	T
Loosestrife, rough-leaved	E
Pink, swamp	T
Pitcher-plant, mountain sweet	E
Pogonia, small whorled	E
Pondberry	E
Quillwort, black-spored	E
Sumac, Michaux's	E
Sunflower, Schweinitz's	E
Trillium, persistent	E
Trillium, relict	E

South Carolina

Red-cockaded Woodpecker

(*Picoides borealis*)—Endangered



Current Status: Threats to the red-cockaded woodpecker (RCW) include: (1) loss of small, geographically isolated populations; (2) growth of hardwood midstory in their preferred habitat of "open" pine forests; (3) loss of nesting and foraging habitat from southern pine beetle infestations; and (4) short rotation forest management, particularly on private lands. The development of hardwood midstories in southern pine forests is directly attributable to decades of fire suppression and lack of aggressive and extensive growing season (generally April-August) prescribed burning programs. As most of the recovery populations exists on federally owned or managed lands, the Fish and Wildlife Service has been active in supporting the concept of ecosystem management and timber harvesting practices that promote species recovery and protection.

Achievements: The RCW has responded very favorably to advances in artificial cavity technology. A significant limiting factor for RCW recovery is the lack of old growth (80-120+ years) pine trees in the southeast. Artificial cavities can be provided in younger trees and thus serve as a short-term population stabilizing factor, while forests are grown to older ages. Artificial cavities have been highly successful in increasing the population on the Francis Marion National Forest in South Carolina following Hurricane Hugo, which destroyed most of the existing RCW cavity trees and killed about 60 percent of the RCWs. Translocation of RCWs (generally relocating a juvenile female to the established territory of a single male) is another proven management tool being used to prevent further declines of already small populations.

Artificial cavity and translocation programs can be used to stop population declines in small populations and increase the rate of population expansion in both small and large populations. Use of these management practices can reverse decades of population declines and should be fully implemented during the short-term (next 20-40 years) while forests produce the older trees needed for RCWs to survive on their own. Translocation and artificial cavity construction techniques have been employed to expand the existing small population on the Savannah River Site in South Carolina. It is hoped that this federally maintained site will provide refugia to a moderately sized RCW population. RCWs have also been moved within the national forests of South Carolina. The Fish and Wildlife Service is currently consulting informally with the Forest Service as it develops its regionwide (11 States with RCWs) environmental impact statement for management of the RCW. Formal consultation is expected to begin in the spring of 1993.

The Fish and Wildlife Service is currently active in discussing the applicability of a rangewide Habitat Conservation Plan for small property private landowners. Silvicultural and State forestry groups in South Carolina are interested and expected to take part in the Habitat Conservation Plan, once the concept is finalized. This would allow for incidental take of small, demographically isolated populations, which are biologically "doomed" regardless of efforts by the Service or landowners to manage and "save" them. Mitigation could include translocation of juveniles to Federal or other public properties that have conservation programs in place.

Current Recovery Needs: Recovery actions should include: (1) development of comprehensive conservation and management plans for national forests and military installations responsible for RCW recovery; (2) halting population declines in small, non-viable populations; (3) habitat restoration and maintenance through the aggressive use of prescribed fire; and (4) development of a private lands strategy that addresses the role of private lands in RCW conservation efforts.

Partnerships

Forest Service: This Federal agency was responsible for developing artificial cavities and translocation techniques for the RCW. By providing artificial cavities, the Forest Service has been highly successful in increasing the RCW population on the Francis Marion National Forest in South Carolina following Hurricane Hugo.

Department of the Army: In 1991, the Department convened a full-time team to address Army responsibilities and plans for RCW management on all installations harboring the species, including several in South Carolina. It is expected that this effort will lead to initi-

Bill Julian

ation of formal section 7 consultation with the Fish and Wildlife Service in 1993.

Good Hope Plantation: Good Hope Plantation, a privately maintained quail and forestry/agricultural operation in southwestern South Carolina, has expressed interest in developing a timber management plan that protects the RCW. It is hoped that all large landowners in South Carolina will consider developing an Habitat Conservation Plan to facilitate RCW protection while maintaining private management objectives.

Recovery Plan Status: Original plan approved 8/24/79; revised 4/11/85.

Schweinitz's Sunflower

(*Helianthus schweinitzii*)—Endangered

Current Status: Only 10 populations of Schweinitz's sunflower remain in South Carolina. Threats to the species include destruction or degradation of its habitat due to residential and industrial development, mining, encroachment by exotic vegetation, highway construction and improvement, roadside and utility right-of-way maintenance, and loss of natural disturbance from fire and native herbivores. Approximately two-thirds of the remaining populations are on roadside or utility line rights-of-way, where they are vulnerable to accidental destruction.

Achievements: A Winthrop College (Rock Hill, South Carolina) researcher is collecting and propagating seed for potential reintroduction or population augmentation. A management agreement has been negotiated with Duke Power Company to mow powerlines where Schweinitz's sunflower occurs only after frost and to use no herbicides at these sites. Another informal agreement has been negotiated between the Fish and Wildlife Service and a county park in Rock Hill, South Carolina, for protection of the plants.

Current Recovery Needs: Necessary recovery actions include continued use of growing season burns to stimulate growth and reproduction, continued seed collection and reintroduction of propagules, and continued monitoring of all populations.

Section 6 Funding and Activities: In FY 1992, the South Carolina Wildlife and Marine Resources Department received $3,000 for monitoring and managing populations of Schweinitz's sunflower.

FWS File Photo

Partnerships

South Carolina Wildlife and Marine Resources Department, Heritage Trust Program: The Department, in cooperation with the Service and Winthrop College researchers, has carried out annual population monitoring and provided technical assistance on management of the species.

Winthrop College: A botanist with the college, in cooperation with the Fish and Wildlife Service and the South Carolina Wildlife and Marine Resources Department, is monitoring sites, negotiating with landowners and right-of-way managers for the species' protection, and propagating plants for reintroduction/augmentation.

Duke Power Company and Carolina Power and Light Company: These utility companies are working with conservation agencies to protect populations located on their rights-of-way.

Recovery Plan Status: Technical draft plan.

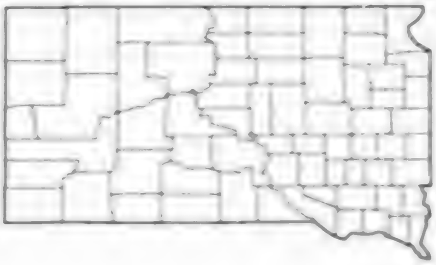
South Dakota

Species Name	*Status*
Ferret, black-footed	E
Crane, whooping	E
Curlew, Eskimo	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Tern, least (interior population)	E
Sturgeon, pallid	E
Orchid, western prairie fringed	T

South Dakota

Black-footed Ferret*

(*Mustela nigripes*)—Endangered



*Extirpated from the wild in South Dakota.

Current Status: Black-footed ferrets prey almost exclusively on prairie dogs. The primary threat to the ferret's recovery is the continued loss of prairie dog colonies, principally from poisoning. Such poisoning degrades and fragments ferret habitat, resulting in only small islands of prairie dog colonies. Very few sites have been identified as suitable for ferret reintroduction.

Achievements: Success of the captive breeding program for the ferret has exceeded all expectations, yielding enough animals to support a ferret reintroduction program. In 1991, ferrets were reintroduced into the wild in Wyoming for the first time. Plans are under way for a draft environmental impact statement and proposed rule on reintroducing a nonessential experimental population of black-footed ferrets into Badlands National Monument and adjoining areas of Buffalo Gap National Grasslands in western South Dakota. The Fish and Wildlife Service will seek public involvement in the environmental impact statement process and any reintroduction proposal.

The Service is also involved in an important section 7 consultation with the Bureau of Indian Affairs on the Rosebud, Cheyenne River, and Pine Ridge Indian Reservations in South Dakota. The consultation involves proposed Federal action in poisoning prairie dogs to reduce perceived competition with livestock for forage. The Service is encouraging the tribes to develop prairie dog management plans for each reservation to allow for control of prairie dogs while conserving sufficient numbers to aid in ferret recovery.

Current Recovery Needs: Increased funding will be needed to locate, develop, and manage ferret reintroduction sites across the West. Also, efforts are needed to stem the loss of prairie dog colonies. Federal land management agencies can assist by developing prairie dog management plans for public lands and by publicizing the benefits of prairie dog conservation to wildlife advocates and livestock grazers.

Tim W Clark

Section 6 Funding and Activities: The South Dakota Game, Fish and Parks Department was provided $20,000 in FY 1991 and $40,000 in FY 1992 for use in identifying suitable prairie dog towns that might serve as ferret reintroduction sites, conducting searches for ferrets, and studying potential disease/predator problems that might affect ferret reintroduction in South Dakota.

Partnerships

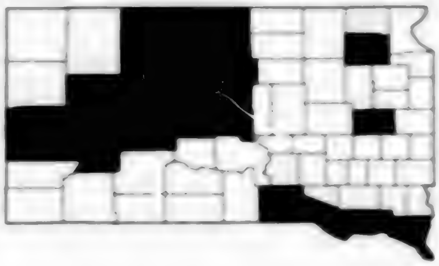
Forest Service and National Park Service: These Federal agencies are assisting in environmental reviews of a proposed reintroduction of black-footed ferrets into South Dakota. If a decision is made to reintroduce the ferret, both agencies will assist in developing the reintroduction protocol and will make personnel available for the reintroduction.

South Dakota Game, Fish and Parks Department: This State agency is mapping prairie dog towns to identify locations that might serve as ferret reintroduction sites or that might already support wild populations of ferrets.

Recovery Plan Status: Original plan approved 6/14/78; revised 8/8/88.

South Dakota

Interior Shorebirds



Species:

Least Tern (Interior Population) (*Sterna antillarum*)—Endangered
Piping Plover (*Charadrius melodus*)—Threatened

Current Status: Habitat quality continues to diminish without the natural replacement that used to occur under the natural spring flooding regime in the major river systems. Predation, flooding of nests by inappropriately timed dam releases, weather extremes, contaminants, and human disturbance have become more significant due to degraded habitat.

Achievements: The Fish and Wildlife Service has worked with the Army Corps of Engineers (Corps) on Missouri River flow releases to reduce nest loss due to flooding caused by irregular dam releases during the nesting season and to create additional habitat. The Corps has been implementing actions connected with a jeopardy biological opinion on impacts to least terns and piping plovers from the Corps' Missouri River main stem system operations, but has failed to provide sufficient protection to achieve the required fledging ratios needed to preclude jeopardy as described in the biological opinion. However, the Corps has made changes in its operations that have significantly reduced flooding of nests and has formed a Tern and Plover Management Team in response to the reasonable and prudent alternatives of the biological opinion. Other section 7 activities have included consultations on section 404 (Clean Water Act) and section 10 (Rivers and Harbors Act) permits, resulting in increased avoidance of impacts (i.e., flooding of nests and destruction of nesting habitat) to terns and plovers. In addition, an active information and education campaign has reduced human disturbance to nesting colonies. Nest cages to reduce plover nest predation have helped to increase nest success.

James P Mattison

Piping Plover

Luther C. Goldman

Least Tern (Interior Population)

Current Recovery Needs: Stemming the loss of nesting habitat is the highest priority, as well as improving habitat and reducing predation and human disturbance. However, increasing habitat may not be the entire answer, and more drastic measures, such as captive propagation and release, may be required. Rangewide monitoring is needed to determine population status. Actions addressing predation are also necessary.

Partnerships

Army Corps of Engineers: This agency is responsible for carrying out a number of tasks under the recovery plans, including assisting with population surveys, evaluating breeding habitat and threats, reducing human disturbance, managing water levels, developing a river management plan, and conducting public education. Although some of these tasks have been partially carried out, many still need to be implemented.

South Dakota Department of Game, Fish and Parks: The Department has carried out a number of its responsibilities under the recovery plan.

Recovery Plan Status:

Interior least tern—plan approved 9/19/90.

Piping plover—plan approved 5/12/88.

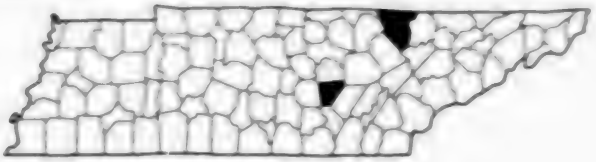
Tennessee

Species Name	*Status*
Bat, gray	E
Bat, Indiana	E
Squirrel, Carolina northern flying	E
Wolf, red	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Tern, least (interior population)	E
Woodpecker, red-cockaded	E
Chub, slender	T
Chub, spotfin	T
Dace, blackside	T
Darter, boulder (=Elk River)	E
Darter, slackwater	T
Darter, snail	T
Logperch, Conasauga	E
Madtom, smoky	E
Madtom, yellowfin	T
Shiner, blue	T
Sturgeon, pallid	E
Snail, painted snake coiled forest	T
Fanshell	E
Mussel, Cumberland pigtoe	E
Mussel, ring pink (=golf stick pearly)	E
Pearly mussel, Alabama lamp	E
Pearly mussel, Appalachain monkeyface	E
Pearly mussel, birdwing	E
Pearly mussel, cracking	E
Pearly mussel, Cumberland bean	E
Pearly mussel, Cumberland monkeyface	E
Pearly mussel, dromedary	E
Pearly mussel, green-blossom	E
Pearly mussel, little-wing	E
Pearly mussel (=pimple back), orange-footed	E
Pearly mussel, pale lilliput	E
Pearly mussel, pink mucket	E
Pearly mussel, purple cat's paw	E
Pearly mussel, tubercled-blossom	E
Pearly mussel, turgid-blossom	E
Pearly mussel, white wartyback	E
Pearly mussel, yellow-blossom	E
Pigtoe, fine-rayed	E
Pigtoe, rough	E
Pigtoe, shiny	E
Riffle shell, tan	E
Crayfish, Nashville	E
Aster, Ruth's golden	E
Avens, spreading	E
Bluet, Roan Mountain	E
Coneflower, Tennessee purple	E
Fern, American hart's-tongue	T
Goldenrod, Blue Ridge	T
Grass, Tennessee yellow-eyed	E
Ground-plum, Guthrie's	E
Pitcher-plant, green	E
Potato-bean, Price's	T
Prairie-clover, leafy	E
Rosemary, Cumberland	T
Sandwort, Cumberland	E
Skullcap, large-flowered	E
Spiraea, Virginia	T

Tennessee

Little-wing Pearly Mussel

(*Pegias fabula*)—Endangered



Current Status: The little-wing pearly mussel faces water quality degradation resulting from industrial and sewage effluents and the runoff of silt and other water pollutants from poorly designed construction, development, mining, agricultural, and forestry activities. Further, the spread of the exotic zebra mussel (*Dreissena polymorpha*) represents a potential threat to the survival of this species. Zebra mussels outcompete native mussel fauna, and infestations in the water column can physically disrupt normal breeding and feeding behavior.

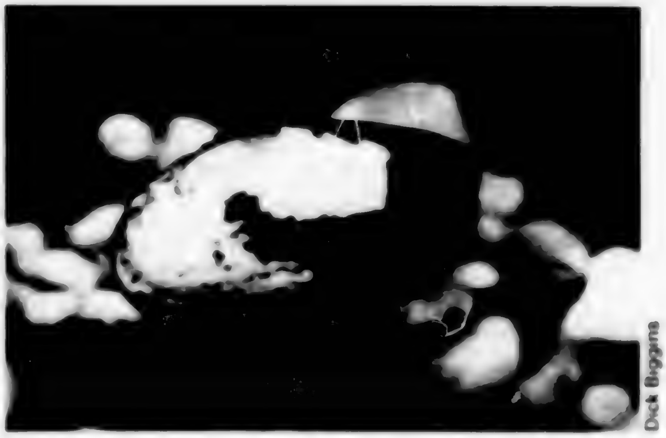
Achievements: Although little measurable progress has been made in establishing new mussel populations or in stabilizing existing populations, substantial recovery efforts for all the State's federally listed mussels are under way. Research is continuing on maintaining captive mussel populations, mussel cryopreservation, and potential impacts of the exotic zebra mussel on native mussels. A section 7 consultation with the Tennessee Valley Authority and the Army Corps of Engineers on a proposed wood chip mill on the Tennessee River is under way.

Current Recovery Needs: Recovery of the little-wing pearly mussel will require additional research to develop new propagation techniques, reintroduction into unoccupied historical habitat, and determination of the factors that are causing declines in the wild. Also, technology is needed for cryopreservation of freshwater mussel genetic material.

Section 6 Funding and Activities: In both FY 1991 and FY 1992, the Tennessee Wildlife Resources Agency was provided $59,500 to study freshwater mussels, including research on artificial propagation, surveying Tennessee River tributaries, and research on mussel reintroduction.

Partnerships

Tennessee Valley Authority (TVA): This Federal agency is responsible for ensuring that its projects do not jeopardize federally listed mussels. TVA has also been an advocate for mussel recovery. The agency conducts mussel surveys as part of its environmental review of proposed projects and maintains a geographic data base on mussel distribution. It is also developing mussel propagation technology, and has conducted a bioassay of various chemicals using juvenile mussels. TVA is also involved in efforts to restore the little-wing pearly mussel in Kentucky and North Carolina.



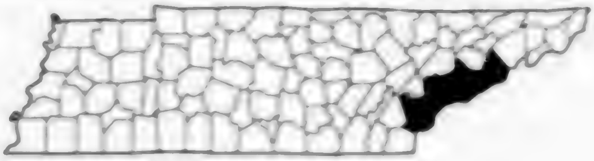
Dick Biggins

Tennessee Wildlife Resources Agency: This State agency is responsible for managing the State's mussel populations and an extensive mussel fishery, conducting mussel surveys, and maintaining a geographic data base on mussel distribution. The Tennessee Wildlife Resources Agency recently implemented new size regulations to reduce the take of immature mussels and also monitors the catch of commercial mussel fishermen to reduce take of federally listed mussels. The agency also has designated nine mussel sanctuaries to protect State and federally protected mussels.

Tennessee Department of Environment and Conservation: Through a natural history data base, this State agency provides valuable information on the distribution of federally listed mussels. It also helps protect these species through its environmental review process.

Aquatic Resource Center: This private organization is developing techniques for artificially propagating freshwater mussels and feeding the resulting juvenile mussels.

Recovery Plan Status: Plan approved 9/22/89.



Red Wolf

(*Canis rufus*)—Endangered

Current Status: Overall, the red wolf population stands at about 196 individuals, which includes captive animals. In Tennessee, nine wild wolves inhabit the Great Smoky Mountains National Park. Threats are posed to these wolves by potential interbreeding with coyotes.

Achievements: The reintroduction of the red wolf to Great Smoky Mountains National Park began in 1991 with the release of four animals in the Tennessee portion. Subsequently, an adult female wolf and two yearlings were pulled back into captivity to pair with suitable red wolf mates. Two new family groups were released in 1992. Although the wolves were released into an area where livestock operations were present, only minor depredations have occurred. An educational package on the red wolf consisting of a 30-minute video tape, a poster, and a teacher packet was prepared and distributed to 800 schools in the area. The poster was judged by Urban Art International as one of the top 20 environmental posters at the national level, and the video received a Mid-south Regional Emmy Award. Public acceptance of wolf reintroduction in this area has been high. In addition to the red wolves at Great Smoky Mountains National Park, a wild population of approximately 32 animals exists at the Alligator River National Wildlife Refuge in North Carolina. There are also three island propagation projects at Bulls Island, South Carolina, St. Vincent Island, Florida, and Horn Island, Mississippi, consisting of four adult wolves. About 156 wolves are located in 30 captive breeding facilities across the Nation, which include the island propagation projects. The first artificial insemination has been achieved.

Current Recovery Needs: Close monitoring of the animals will continue, and problem animals will be dealt with immediately. Existing coyotes in the park will be radio collared and monitored. Expanding the wolf reintroduction project onto Forest Service land is desirable to increase the habitat base and help increase the population to a level less likely to be eliminated by catastrophic events.

Beth Campbell

Partnerships

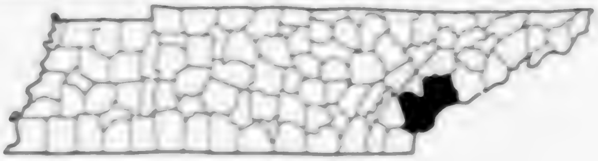
National Park Service: This Federal agency has provided administrative support and manpower for the reintroduction project through funding provided by the Fish and Wildlife Service via an interagency agreement.

Tennessee Wildlife Resources Agency: This State agency worked with the Fish and Wildlife Service on the Great Smoky Mountains National Park reintroduction in 1991. The Service will request the agency's approval to expand the reintroduction project onto Forest Service lands.

Tennessee Valley Authority: The Tennessee Valley Authority's Woodlands Nature Center at Land Between the Lakes became a captive breeding facility for red wolves in 1991.

Knoxville Zoo: This zoo became a cooperative captive breeding facility in 1991 and has one pair of adult red wolves. This facility successfully produced litters during both years it has been in the program.

Recovery Plan Status: Original plan approved 7/12/82; revised 10/26/90.



Smoky Madtom

(*Noturus baileyi*)—Endangered

Current Status: The smoky madtom is currently known from about 6 miles of one stream in eastern Tennessee. Because of its limited distribution, the madtom is threatened by the possibility of a toxic chemical spill or anything else that would degrade the stream reach it inhabits.

Achievements: Smoky madtom eggs and larvae have been collected from the wild, reared to the juvenile stage in captivity, and reintroduced into unoccupied historic habitat. As yet, there is no indication that the introduced population has reproduced, but some of the juveniles have reached adulthood. A captive population is being maintained, and research on artificial propagation is under way. An informal section 7 consultation with the Forest Service on a proposed campground adjacent to smoky madtom habitat reached a satisfactory conclusion when an alternate location for the facility was chosen.

Current Recovery Needs: Artificial propagation and reintroduction techniques need refinement. The species should continue to be reintroduced into unoccupied historic habitat.

Section 6 Funding and Activities: In FY 1991, the Tennessee Wildlife Resources Agency was provided $7,600 to collect smoky madtom eggs and larvae, rear them to juveniles, reintroduce the juveniles into unoccupied historic habitat, maintain a captive smoky madtom population, attempt to artificially propagate the species, and search for potential reintroduction sites. In FY 1992, the agency was provided $18,861 to continue these activities.

Partnerships

Forest Service: This Federal agency has assisted in conserving the smoky madtom. It provided technical assistance on the propagation and reintroduction project, and contributed funds to monitor the population.

National Park Service: This Federal agency has also provided technical assistance on the smoky madtom propagation and reintroduction project.

Tennessee Valley Authority: This agency has been an advocate for fish recovery and has provided technical assistance on the smoky madtom propagation and reintroduction project.

Tennessee Wildlife Resources Agency: In addition to its section 6 activities, this State agency is responsible for managing the State's fish populations. The agency provided technical assistance on the propagation and reintroduction project.

Tennessee Department of Environment and Conservation: This State agency maintains a geographic data base on the distribution of fish. Through its environmental review process, the agency helps protect this species.

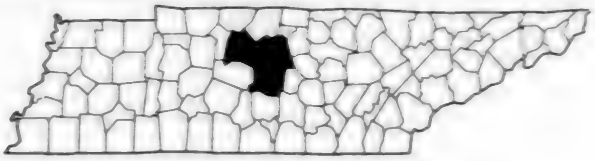
Lifespace Technologies: This private organization is conducting propagation and reintroduction research on the madtom for the Tennessee Wildlife Resources Agency. It is also conducting monitoring research for the Forest Service.

Recovery Plan Status: Plan approved 8/9/85.

Dick Biggins

Tennessee Purple Coneflower

(*Echinacea tennesseensis*)—Endangered



Current Status: All 5 known populations of the species are within 14 miles of one another. The greatest threat to the Tennessee purple coneflower is loss or adverse modification of its habitat due to road building; commercial, residential, and industrial construction; intensive livestock grazing; encroaching vegetation; and off-road vehicle use.

Achievements: Studies of the species' biological requirements have been completed, and a long-term evaluation of management techniques for maintaining and improving its habitat has been initiated. Portions of two populations on State-owned property are protected through a management agreement with the Tennessee Department of Environment and Conservation. The Nature Conservancy has purchased two sites supporting the species.

Current Recovery Needs: The highest priority is to secure permanent protection for the remaining coneflower sites. This will require purchasing property or obtaining long-term conservation easements. Research on habitat management techniques is also necessary.

Section 6 Funding and Activities: In FY 1991, $11,230 were provided to the Tennessee Department of Environment and Conservation to begin a study on management techniques, conduct an experimental project to reestablish the species, continue maintenance of the species in cultivation and provide seeds for research, and obtain baseline data for monitoring the success of recovery efforts. In FY 1992, $9,000 were provided to the Department to continue the management techniques study, continue maintenance of the species in cultivation, and begin a site protection project with construction of a fence.

Paul Somers

Partnerships

Tennessee Department of Environment and Conservation: In addition to activities conducted through its section 6 cooperative agreement with the Fish and Wildlife Service, the Department has also initiated a landowner contact/site protection project for the protection of the Tennessee purple coneflower and two other federally listed plants. Funds provided by the Service for this 2-year project will be matched by The Nature Conservancy.

The Nature Conservancy: The Conservancy has an active land protection program in the cedar glade region of Tennessee and has acquired two sites that support the Tennessee purple coneflower. The Conservancy will provide funding for half of the cost of the Tennessee Department of Environment and Conservation's landowner identification/site protection project.

Recovery Plan Status: Original plan approved 2/14/83; revised 11/14/89.

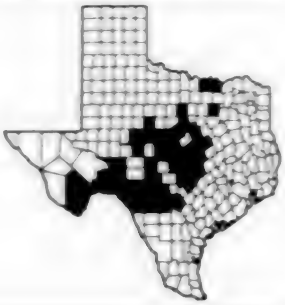
Texas

Species Name	*Status*
Bat, Mexican long-nosed	E
Bear, Louisiana black	T
Jaguarundi	E
Manatee, West Indian (=Florida)	E
Ocelot	E
Crane, whooping	E
Curlew, Eskimo	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Falcon, northern aplomado	E
Pelican, brown	E
Plover, piping	T
Prairie-chicken, Attwater's greater	E
Tern, least (interior population)	E
Vireo, black-capped	E
Warbler (wood), golden-cheeked	E
Woodpecker, red-cockaded	E
Snake, Concho water	T
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, Kemp's (=Atlantic) ridley sea	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Salamander, San Marcos	T
Salamander, Texas blind	E
Toad, Houston	E
Darter, fountain	E
Gambusia, Big Bend	E
Gambusia, Clear Creek	E
Gambusia, Pecos	E
Gambusia, San Marcos	E
Pupfish, Comanche Springs	E
Pupfish, Leon Springs	E
Beetle, Kretschmarr Cave mold	E
Beetle, Tooth Cave ground	E
Harvestman, Bee Creek Cave	E
Pseudoscorpion, Tooth Cave	E
Spider, Tooth Cave	E
Bladderpod, white	E
Cactus, black lace	E
Cactus, bunched cory	T
Cactus, Chisos Mountain hedgehog	T
Cactus, Lloyd's hedgehog	E
Cactus, Lloyd's Mariposa	T
Cactus, Nellie cory	E
Cactus, Sneed pincushion	E
Cactus, Tobusch fishhook	E
Cats-eye, Terlingua Creek	E
Dawn-flower, Texas prairie (Texas bitterweed)	E
Dogweed, ashy	E
Frankenia, Johnston's	E
Ladies'-tresses, Navasota	E
Manioc, Walker's	E
Oak, Hinckley's	T
Pennyroyal, McKittrick	T
Phlox, Texas trailing	E
Pitaya, Davis' green	E
Pondweed, Little Aguja	E
Poppy-mallow, Texas	E
Rush-pea, slender	E
Sand-verbena, large-fruited	E
Snowbells, Texas	E
Wild-rice, Texas	E

Texas

Black-capped Vireo

(*Vireo atricapillus*)—Endangered



Current Status: Loss of habitat to urbanization and other land uses, and nest parasitism by the brown-headed cowbird, continue to pose threats to the black-capped vireo in Texas.

Achievements: Cowbird control seems responsible for increased vireo nesting success in two populations, one at Fort Hood Military Reservation and one at Kerr Wildlife Management Area. Formal section 7 consultations have been completed for a variety of projects; all resulted in no-jeopardy biological opinions and all reasonable and prudent measures recommended were accepted. The Black-capped Vireo Recovery Plan also has been completed. As a result, the Fish and Wildlife Service is working with the Texas Parks and Wildlife Department, Soil Conservation Service, and others to formulate conservation management guidelines for private landowners. In addition, Travis County, the city of Austin, The Nature Conservancy, Texas Parks and Wildlife Department, Audubon Society (Travis County Chapter and the Regional Office in Austin), and others are cooperating with the Fish and Wildlife Service on a Habitat Conservation Plan for the vireo and six other species in the Austin area. A bond election approved $22 million for the purchase of Resolution Trust Corporation lands to preserve habitat for these species. Also, the Fish and Wildlife Service is purchasing land for the Balcones Canyonland National Wildlife Refuge, which will protect habitat for the vireo and other rare species.

Current Recovery Needs: Actions necessary to recover the species include cowbird control, continued monitoring of vireo populations, and habitat restoration and management. Research needs include examining the biology/ecology of vireos on their wintering grounds, determining the effects of nest predators on reproductive success, and defining habitat requirements.

Section 6 Funding and Activities: The Texas Parks and Wildlife Department received $30,000 in FY 1992 for vireo surveys and management, including cowbird control, on State lands.

Roger Clapp

Partnerships

Department of Defense: For 6 years, the Department of Defense has been involved in black-capped vireo activities. Fort Hood Military Reservation and Camp Bullis have been monitoring vireo populations. Fort Hood also is conducting a banding project, controlling cowbirds, and experimenting with cattle removal from selected areas to determine the impacts on nesting success.

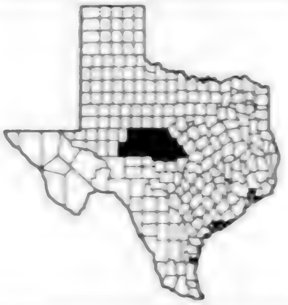
Texas Parks and Wildlife Department: The Department is conducting vireo surveys and management, including cowbird control, on State lands.

The Nature Conservancy: This organization is developing the Hill County Bioreserve, which includes part of the vireo's range.

Recovery Plan Status: Plan approved 9/30/91.

Concho Water Snake

(*Nerodia harteri paucimaculata*)—Threatened



Current Status: This nonvenomous snake is endemic to the Concho and Colorado River systems. The free-flowing riverine habitat upon which it depends faces a number of threats, primarily reservoir inundation and flow modifications. Other dangers to the snake include water quality degradation, fragmentation and isolation of populations following habitat disturbance, and sedimentation coupled with encroachment of vegetation.

Achievements: The Fish and Wildlife Service conducted a formal section 7 consultation with the Army Corps of Engineers on construction of the O.H. Ivie Reservoir. Although the project as proposed was found likely to jeopardize the snake, the Service suggested reasonable and prudent alternatives that allowed construction to continue. One alternative was the creation of artificial riffles (shallow shoals) to provide habitat favored by Concho water snake juveniles. Six artificial riffles were built in August 1989, accompanied by minimum flows and channel maintenance flows from Robert Lee Dam as required under the reasonable and prudent alternatives. In 1990, the fish prey base in the riffles was found to be similar to that in undisturbed habitat occupied by the snake. In 1991, four of the six riffles had been naturally colonized by Concho water snakes of all ages. By 1992, all six riffles were occupied. These sites will be monitored to determine whether silt and vegetation will encroach again.

Norman Scott

Current Recovery Needs: Needed recovery actions include securing adequate stream flows in the Colorado and Concho Rivers; monitoring and evaluating snake populations and habitat rangewide; identifying, monitoring, and eliminating or reducing threats to snake populations (including habitat degradation such as sedimentation, vegetation encroachment, and water quality) through consultation, permitting, and cooperative programs; reestablishing the snake in river segments and creeks where it has been extirpated; and maintaining gene flow among the three nearest neighbor populations through snake translocations.

Partnerships

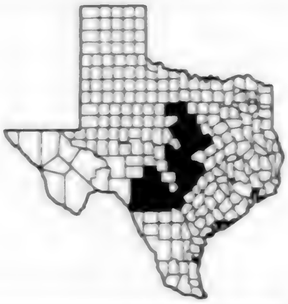
Army Corps of Engineers: The Corps implements the reasonable and prudent alternatives developed under formal section 7 consultation for construction of the O.H. Ivie Reservoir.

Colorado River Municipal Water District: The municipal water district created Concho water snake habitat in its historic range, and continues to conduct studies on the biology, physical habitat requirements, and genetic viability of snake populations, as well as analysis of various management alternatives.

Recovery Plan Status: Technical/Agency draft plan.

Golden-cheeked Warbler

(Dendroica chrysoparia)—Endangered



Current Status: Threats include habitat loss due to urbanization and other land use practices, as well as nest parasitism by the brown-headed cowbird.

Achievements: Establishment of the Balcones Canyonlands National Wildlife Refuge has begun with the purchase of 3,500 acres containing golden-cheeked warbler habitat, offering safe haven for the bird on Federal land. Formal section 7 consultations also have been completed for a variety of projects including: a golf course and resort hotel, apartment and housing complex (Army Corps of Engineers); business development (Environmental Protection Agency); radio tower (Federal Communications Commission); and various highway projects (Federal Highway Administration). Consultation resulted in no-jeopardy biological opinions, and all reasonable and prudent measures were accepted. Two other section 7 consultations are anticipated on military base operations (Department of Defense) and technical assistance on brush clearing and conservation measures (Soil Conservation Service). In addition, Travis County, the city of Austin, The Nature Conservancy, Texas Parks and Wildlife Department, National Audubon Society, Fish and Wildlife Service, and other groups continue to cooperate on a comprehensive Habitat Conservation Plan for seven listed species in the Austin, Texas, area. Also, the Golden-cheeked Warbler Recovery Plan has been completed, and a recovery team appointed. The Fish and Wildlife Service is working with the Texas Parks and Wildlife Department, Soil Conservation Service, and other entities to formulate Golden-cheeked Warbler Conservation Management Guidelines for private landowners.

Current Recovery Needs: Needed recovery actions include increased landowner education and involvement, identification of winter and migratory habitat, reduced nest parasitism from cowbirds, and protection of all habitat types (e.g., nesting, wintering) required to recover this bird.

Section 6 Funding and Activities: The Texas Parks and Wildlife Department received $20,500 in FY 1991 and $35,000 in FY 1992 for a Geographical Information System (GIS) project to locate potential warbler habitat. A total of $53,000 funded the GIS, with $2,500 set aside to conduct banding and a habitat study.

Partnerships

Department of Defense: Fort Hood Military Reservation and Camp Bullis are monitoring golden-cheeked warbler populations. Fort Hood also is conducting a banding project. Both studies are in their second year.

Texas Parks and Wildlife Department: Involvement in the Habitat Conservation Plan and the Conservation Management Guidelines has helped to move species recovery activities forward.

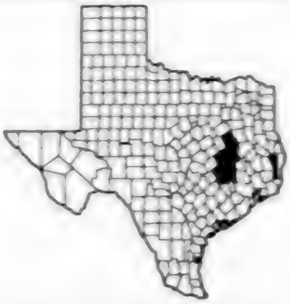
The Nature Conservancy: The Hill County Bioreserve, under development by this Fish and Wildlife Service partner, includes a majority of the species' range.

Recovery Plan Status: Plan approved 9/30/92.

Don Bleitz

Navasota Ladies'-tresses

(*Spiranthes parksii*)—Endangered



Current Status: Oil and gas exploration, mining activities, and habitat alteration for agricultural purposes continue to threaten this fragile orchid, as does the rapid growth of College Station residential and commercial areas and transportation systems.

Achievements: The recent discovery of two new populations has added to the known numbers of this species. Under a section 7 consultation with the Environmental Protection Agency, a no-jeopardy opinion was issued in connection with the 30-year mining plan at the Gibbons Creek Lignite Mine. The Texas Municipal Power Agency agreed to protect an orchid site from mining activity, and to continue transplanting orchids from mining-disturbed areas to protected sites. This agency also agreed to monitor the species at these protected sites, conduct annual plant surveys on project lands, and design a mining plan protecting orchid concentrations at the southeastern part of the mine, thus reducing potential impact to the species.

Charlie McDonald

Current Recovery Needs: Increasing the number of protected sites on public and private lands is a high priority. Continued monitoring of selected populations to clarify demographic information also is needed, as is research into appropriate habitat management strategies.

Partnerships

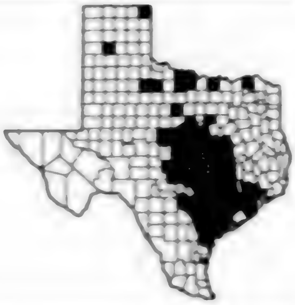
Texas Municipal Power Agency: Navasota ladies'-tresses receive protection at several sites on Gibbons Creek Lignite Mine Project lands. These lands are set aside by the Texas Municipal Power Agency and protected from future mining activity. These areas are fenced and used for cattle grazing at levels that do not harm the plants.

Texas A&M University: University staff have been monitoring orchid populations to obtain information describing the plants' ecological and demographic status. They also are assisting with a draft revision of the recovery plan.

Recovery Plan Status: Plan approved 9/21/84.

Whooping Crane

(*Grus americana*)—Endangered



Current Status: The whooping crane continues to be threatened by the possibility of a hurricane or accidental contaminant spill on its Texas coast wintering grounds. Other threats include disease, intentional or accidental shooting, and the loss of coastal habitat to erosion and land development.

Achievements: The whooping crane has responded favorably to management activities in Texas and elsewhere. The wintering population is expected to grow to about 145 birds by December 1992, compared to 132 in December 1991. Prescribed burning of 2,500 acres on the Aransas and Matagorda Island Refuge Complex provides the birds access to a variety of upland foods. For the fourth year, volunteers, Fish and Wildlife Service employees, and representatives from other agencies placed sandbags along eroding marshlands that are critical habitat for the cranes. This year's efforts protected half a mile of critical habitat from erosion by barge wakes. Dredge spoil was used to create 15 acres of marsh. Planted with aquatic plants, these marshlands were first used by a whooping crane in January 1992.

FWS File Photo

Current Recovery Needs: Whooping cranes will need continued habitat protection, regular population monitoring, egg switching on nesting grounds to replace infertile eggs with fertile ones from another nest, prescribed burning, marsh creation, and studies of competition for food with humans and other wildlife.

Partnerships

Army Corps of Engineers: The Corps protects whooping crane habitat through its permitting process for private-sector dredge and fill activities at coastal sites, and consults with the Fish and Wildlife Service on its own dredging activities at those sites. Also, the Corps is assisting in testing methods of dredge spoil disposal to create marshlands, and is placing concrete slabs to protect marshlands from erosion.

Texas Parks and Wildlife Department: This State agency is assisting in managing the Matagorda Island portion of the Federal refuge, conducting surveys near Matagorda Island, protecting the cranes, and providing a State member to the Whooping Crane Recovery Team.

Mitchell Energy Corporation: The Corporation created 15 acres of marshland with dredge spoil, in compliance with Army Corps of Engineers permit requirements, and planted aquatic vegetation on that acreage.

Canadian Wildlife Service: Fish and Wildlife Service biologists and pilots are assisting the Canadian Wildlife Service in the annual egg pickup and chick surveys at the breeding grounds in the Northwest Territories.

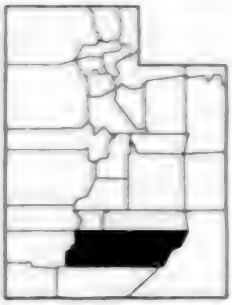
Recovery Plan Status: Original plan approved 4/12/85; revised 12/23/86.

Utah

Species Name	*Status*
Ferret, black-footed	E
Prairie dog, Utah	T
Crane, whooping	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Tortoise, desert	T
Chub, bonytail	E
Chub, humpback	E
Chub, Virgin River	E
Squawfish, Colorado	E
Sucker, June	E
Sucker, razorback	E
Trout, Lahontan cutthroat	T
Woundfin	E
Ambersnail, Kanab	E
Bear-poppy, dwarf	E
Buttercup, autumn	E
Cactus, San Rafael	E
Cactus, Siler pincushion	E
Cactus, spineless hedgehog	E
Cactus, Uinta Basin hookless	T
Cactus, Wright fishhook	E
Cycladenia, Jones	T
Daisy, Maguire	E
Ladies'-tresses, Ute	T
Milk-vetch, heliotrope	T
Milkweed, Welsh's	T
Phacelia, clay	E
Primrose, Maguire	T
Reed-mustard, Barneby	E
Reed-mustard, clay	T
Reed-mustard, shrubby (toad-flax cress)	E
Ridge-cress (=peppercress), Barneby	E
Townsendia, Last Chance	T

Autumn Buttercup

(*Ranunculus acriformis* var. *aestivalis*)—Endangered



Current Status: Grazing and trampling by livestock, irrigation, and related agricultural practices have destroyed most of the autumn buttercup's historic habitat.

Achievements: The Nature Conservancy has acquired and fenced much of the species' remaining habitat, alleviating damage from excessive livestock grazing and trampling. The Fish and Wildlife Service assisted The Nature Conservancy in this effort. As a result, the species' population increased from 12 plants in 1987 to over 500 in 1991. The Nature Conservancy and Service funding have also provided habitat surveys, population monitoring, and genetic studies.

Current Recovery Needs: Recovery of the autumn buttercup will require continued protection for The Nature Conservancy site, protection of the species' other known population, discovery and/or establishment of additional populations in suitable habitat, and increased biological and ecological studies of the species and its habitat.

Section 6 Funding and Activities: The Utah Natural Heritage Program received $6,000 in FY 1991 and another $6,000 in FY 1992 to survey and monitor autumn buttercup populations.

Partnerships

Forest Service, Bureau of Land Management, National Park Service, and Soil Conservation Service: These Federal agencies are identified in the species' recovery plan as being responsible for its recovery. Currently, however, there are no known populations of the autumn buttercup on land under Federal jurisdiction.

Utah Natural Heritage Program: This State agency inventories and monitors the species' populations.

K. Mutz

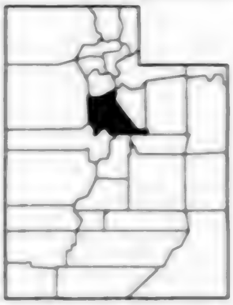
The Nature Conservancy: The Conservancy, a private organization, acquired autumn buttercup habitat near Bear Valley and protects it from livestock grazing.

Arboretum at Flagstaff (Center for Plant Conservation program), Brigham Young University's Botany Department, and Utah State University's Bee Biology and Systematics Laboratory: These three partners in recovery are conducting research on the biology and ecology of the autumn buttercup.

Recovery Plan Status: Plan approved 9/16/91.

Clay Phacelia

(*Phacelia argillacea*)—Endangered



Current Status: Grazing and trampling by livestock and wildlife, along with road and railway construction, have destroyed most of the species' limited habitat.

Achievements: The Nature Conservancy has acquired much of the species' occupied habitat and constructed a boundary fence around the primary portion, thus protecting it from excessive grazing. The population has increased from 3 reproducing plants in 1988 to over 200 in 1992 because of this habitat protection. Habitat surveys, population monitoring, and genetic studies have been initiated with funding from the Fish and Wildlife Service, Forest Service, and Utah Native Plant Society.

Larry England

Current Recovery Needs: The habitat on The Nature Conservancy's property will need continued protection. Also, efforts should be made to acquire and protect the only other known population, which occurs on private land. Surveys for any additional populations and reestablishment of populations on suitable habitat would aid in recovery. Additional biological and ecological studies of the species and its habitat are also needed.

Partnerships

Forest Service: Although no populations of the clay phacelia have been located on Federal lands, potential habitat exists within Spanish Fork Canyon on the Uinta National Forest. The Forest Service is conducting surveys to discover if populations of the plant and potential habitat occur on its lands.

State Arboretum of Utah (Center for Plant Conservation program), Brigham Young University's Botany Department, and Utah State University's Bee Biology and Systematics Laboratory: These three partners in recovery are conducting research on the biology and ecology of the clay phacelia.

The Nature Conservancy: This private organization has acquired species habitat near Tucker in Spanish Fork Canyon. It has also prevented livestock grazing in the area by constructing a protective fence.

Recovery Plan Status: Plan approved 4/12/92.

Colorado River Fishes

Species:
Colorado Squawfish (*Ptychocheilus lucius*)—Endangered
Humpback Chub (*Gila cypha*)—Endangered
Bonytail Chub (*Gila elegans*)—Endangered
Razorback Sucker (*Xyrauchen texanus*)—Endangered

Current Status: These endangered Colorado River fishes are threatened by destruction of floodplain habitat, reduction of spring flows, alteration of natural river flows, flow fluctuations for hydropower production, passage barriers, contaminants, cold water temperatures below mainstem reservoirs, and competition with and predation by nonnative fishes.

Achievements: The highest priority for the endangered Colorado River fishes is to prevent their extinction until recovery can be achieved. To meet that priority, the Fish and Wildlife Service's hatchery/research facility in Ouray, Utah, is spawning and rearing razorback suckers to be held as stock for future reintroduction. Plans are also under way to develop genetically representative gene banks for all known stocks of the four endangered fish species. The next priority is to restore habitat for these species so that recovery can be achieved. Several programs are under way to determine the best methods for diminishing threats to these species, and efforts are being made to restore significant portions of the fishes' historical range.

Current Recovery Needs: Habitat restoration will be vital for recovering these endangered fishes. Floodplain habitats will need to be reconnected to mainstem rivers so that they flood seasonally, flows must be managed to mimic historical conditions, fish passage must be restored at some locales, nonnative fishes must be controlled where they impact these native species, contaminants must be reduced, and opportunities for releasing warmer water from reservoirs must be explored. In some areas, captive-bred fishes will have to be reintroduced to evaluate habitat restoration efforts.

Section 6 Funding and Activities: The State of Utah was provided $101,900 in FY 1991 and $98,700 in FY 1992 for Utah's participation in the Recovery Implementation Program, monitoring Colorado squawfish population status and trends, cooperative research in the Flaming Gorge area, flow effects on young-of-the-year squawfish, habitat surveys, genetics and propagation research, taxonomic studies, and participation in the Information and Education Program.

Partnerships

Recovery Implementation Program for the Endangered Fishes in the Upper Colorado River Basin: The goals of this program include recovery of the four fishes in the upper Colorado River basin (excluding the San Juan River basin) while allowing water development to continue. Major elements include determination of habitat needs, restoration of habitat to meet those needs, propagation and genetics management, management of nonnative fishes, research, monitoring of fishes and habitats, and data management. Participants include four Federal agencies: the Fish and Wildlife Service, Bureau of Reclamation, Western Area Power Administration, and National Park Service. State agencies include the Colorado Department of Natural Resources, Utah Department of Natural Resources, and State of Wyoming. Also involved are various conservation groups and upper basin water users.

San Juan River Seven-Year Research Plan: The purpose of this Plan is to determine the physical, chemical, and biological factors limiting native fish populations in the San Juan River, and to provide management options to restore the endangered fish community. Plan participants include three Federal agencies: the Fish and Wildlife Service, Bureau of Reclamation, and Bureau of Indian Affairs. State participants include the Colorado Division of Wildlife, Utah Division of Wildlife Resources, and New Mexico Game and Fish Department. The Bureau of Reclamation is committed to funding the research, as well as operating Navajo Dam to provide test flows for the research.

San Juan River Basin Recovery Implementation Program: The purpose of this program is to restore endangered fishes in the San Juan River basin while water development proceeds. Federal participants include the Fish and Wildlife Service, Bureau of Reclamation, and Bureau of Indian Affairs. The States of Colorado, Utah, and New Mexico are also involved. Additional participants are the Navajo Nation, Southern Ute Indian Tribe, Ute Mountain Ute Indian Tribe, Jicarilla Apache Indian Tribe, local governments, and non-Federal water development interests. Major elements of the program include genetics management and population augmentation; protection, management, and restoration of habitat; studies of interactions between native and nonnative fish species; monitoring; and data management.

Recovery Plan Status:

Colorado squawfish—original plan approved 3/16/78; revised 8/6/91.

Humpback chub—original plan approved 8/22/79; revised 9/19/90.

Bonytail chub—original plan approved 5/16/84; revised 9/4/90.

Razorback sucker—plan under development.

razorback sucker

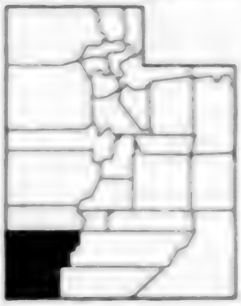
humpback chub

bonytail chub

Colorado squawfish

drawings by Dr. Robert J. Behnke

Utah



Desert Tortoise

(Gopherus agassizii)—Threatened

Current Status: The desert tortoise faces threats from the rapid human population growth and development taking place in its habitat in Washington County, Utah.

Achievements: The Fish and Wildlife Service is continuing to coordinate with other Federal and local agencies in the development of a Habitat Conservation Plan for Washington County. The Habitat Conservation Plan has been under development since January 1991 when a 15-member steering committee was formed to represent a wide array of interests involved in conservation of the desert tortoise. A first draft of the Habitat Conservation Plan was issued in March 1992. The steering committee, on which the Service sits in a nonvoting, advisory capacity, is in the process of preparing another draft plan, which will try to resolve differing opinions. Congress, through the Service, provided $70,000 to Washington County in FY 1992 for completion of the environmental impact statement to be included with the Habitat Conservation Plan. Section 7 consultations have been completed with the Utah Associated Municipal Power Systems through the Bureau of Land Management for several transmission line projects. The resulting no-jeopardy biological opinions stipulated numerous reasonable and prudent measures, including the use of desert tortoise handling procedures, conducting education programs, and protection of other tortoise habitat, to avoid adverse impacts on the tortoise. Section 7 consultations have been initiated with the Green Spring Development Corporation through the Department of Housing and Urban Development for a 422-acre development project in Washington, Utah, that has the potential to disturb 312 acres of desert tortoise habitat.

Current Recovery Needs: Necessary recovery actions include increased law enforcement to monitor activities resulting from the rapid development taking place in the species' habitat; completion of a biologically sound Habitat Conservation Plan for Washington County; research on tortoise relocation success; continued studies on the upper respiratory tract disease that is threatening some populations; completion of the Desert Tortoise Recovery Plan; and research to better understand the species, its nutritional needs, and the condition of its habitat.

Section 6 Funding and Activities: The Utah Division of Wildlife Resources received $22,000 in FY 1991 and $35,000 in FY 1992 to conduct studies on desert tortoise growth, health, abundance, habitat use, and habitat quality.

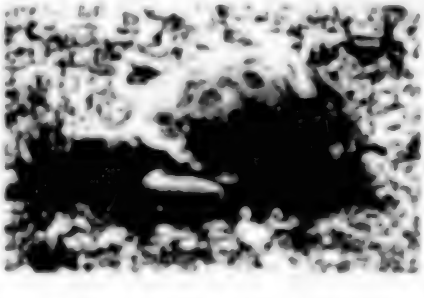
Partnerships

Bureau of Land Management: This Federal agency is responsible for managing its desert tortoise habitat in ways that ensure the species' protection. The results of its research on nutritional and foraging ecology are already being used by the Fish and Wildlife Service for developing the Desert Tortoise Recovery Plan, by the Bureau for planning appropriate habitat management, and by Washington County for developing its Habitat Conservation Plan. Additionally, the Bureau is pursuing land trades with the State of Utah to facilitate management and protection of desert tortoise habitat. The Bureau is also active in Washington County's Habitat Conservation Plan process.

Utah Division of Wildlife Resources: This State agency works with the Fish and Wildlife Service and the Bureau of Land Management in the conservation of the desert tortoise and its habitat. In addition, the Division is participating in the Washington County Habitat Conservation Plan process.

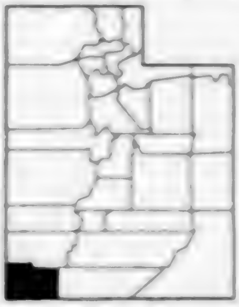
The Nature Conservancy: The Conservancy is working with the State of Utah to acquire habitat for the desert tortoise on private lands. The Conservancy also plans to play a role in facilitating land exchange between the Bureau of Land Management and the State. The Conservancy is represented on the Washington County Habitat Conservation Plan steering committee.

Recovery Plan Status: Plan under development.



C. Kenneth Dodd, Jr.

Utah



Dwarf Bear-poppy

(*Arctomecon humilis*)—Endangered

Current Status: The poppy's exacting soil requirements make it extremely susceptible to habitat loss and destruction resulting from recreational and commercial off-road vehicle use, mining claim assesement work, and urban expansion.

Achievements: Regulatory closing of poppy habitat on Federal land has reduced habitat damage caused by off-road vehicles. This protection and the end of Utah's severe drought have helped reverse the poppy's drastic decline of the past 5 years. Research on the biology and ecology of the species has been initiated, as well as population and habitat monitoring. In addition, the poppy will be considered in the Habitat Conservation Plan being developed for the desert tortoise in Washington County. Various formal and informal section 7 consultations also have been completed, primarily with the Bureau of Land Management regarding road rights-of-way and utility corridors. All section 7 consultations have resulted in no-jeopardy biological opinions, and projects have been able to be redesigned to avoid impacting this species.

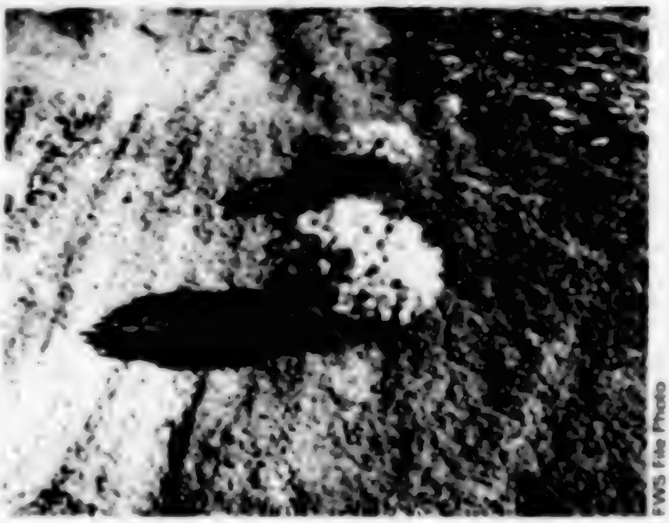
Current Recovery Needs: The poppy requires continued and increased habitat protection on Federal lands, as well as protection on State and private lands.

Section 6 Funding and Activities: The Utah Natural Heritage Program, under the Utah Division of Wildlife Resources, received $6,000 in FY 1992 for surveying and monitoring the species.

Partnerships

Bureau of Land Management: The Bureau has actively managed the species' habitat, established an off-road vehicle management plan for habitat protection, and been involved in population monitoring studies.

Utah Natural Heritage Program: This partner in recovery has been inventorying potential habitat and monitoring populations.



FWS File Photo

The Nature Conservancy: The Conservancy has constructed a fence that protects part of the dwarf bear-poppy population on State and Bureau of Land Management lands.

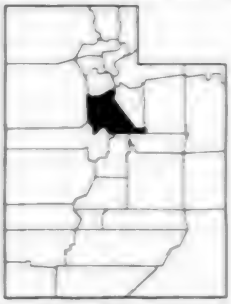
Brigham Young University and Utah State University: Brigham Young University's Botany Department is researching the species' biology and ecology, while The Bee Biology and Systematics Laboratory at Utah State University has completed intensive research on species pollination.

Utah Native Plant Society: The Society developed an audio-visual program explaining the importance of conserving dwarf bear-poppy habitat and distributed the program to schools in Washington County.

Recovery Plan Status: Plan approved 12/31/85.

June Sucker

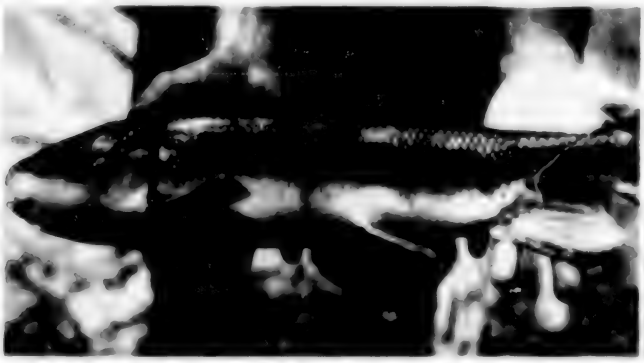
(*Chasmistes liorus*)—Endangered



Current Status: Threats to the June sucker include inadequate water quantity and quality through the spawning area. Predation from nonnative white bass and walleye has prevented fish recruitment into the existing population. The loss of vegetated shorelines may also be contributing to the lack of recruitment.

Achievements: The June sucker has been very close to extinction because of heavy predation on the fry. Two years ago the species had an aging population with no known recruitment. Then a successful effort to propagate the species was begun. The Fish and Wildlife Service, Bureau of Reclamation, Central Utah Water Conservancy District, Provo Water Users, and Utah Division of Wildlife Resources worked cooperatively to procure water for the June sucker spawning area during the spawning season, even though the area is experiencing severe drought. As a result, June suckers were captured, they spawned successfully, and 6,000 fry were produced. These fry will be used to develop brood and refugium populations. A Memorandum of Agreement between the Forest Service, Utah Division of Wildlife Resources, and Fish and Wildlife Service resulted in the creation of a holding area for June suckers in Red Butte Reservoir on Wasatch-Cache National Forests.

Current Recovery Needs: To protect spawning June suckers and their habitat, flow agreements need to be developed. Also, additional brood and refugium populations need to be established.



FWS File Photo

Section 6 Funding and Activities: The Utah Division of Wildlife Resources was provided $20,000 in FY 1991 and $48,988 in FY 1992 for capturing, spawning, rearing, and holding June suckers.

Partnerships

Bureau of Reclamation: The Bureau of Reclamation is participating in a genetics study and helping in construction of a weir to capture fish during the spawning season.

Forest Service: This Federal agency provided Red Butte Reservoir for use in establishing a temporary refuge and rearing area for June suckers.

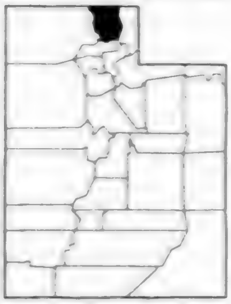
Utah Division of Wildlife Resources: This State agency has participated in capturing spawning June suckers and in monitoring population levels through a tagging and recapture effort.

Central Utah Water Conservancy District: This private organization is participating in a genetics study of the June sucker and is helping to acquire water for the spawning area during periods of drought. It will also help to acquire areas for establishing refugium and grow-out facilities.

Utah Correction Institute: This State penitentiary maintains a June sucker rearing facility. At present, over 400 fish are being raised at the facility with excellent results. Plans for the immediate future are to transport an additional 1,100 June suckers to the facility for rearing.

Recovery Plan Status: Technical draft plan.

Utah



Maguire Primrose

(Primula maguirei)—Threatened

Current Status: All Maguire primrose populations on Federal lands are in the lower elevations of Logan Canyon in Wasatch National Forest. Plant habitat has been diminished by highway construction, and plants have been trampled by hikers and rock climbers.

FWS File Photo

Achievements: Successful section 7 consultations led to protection of primrose habitat while allowing the completion of two Federal activities, a Federal Highway Administration project and a Forest Service recreational plan for Logan Canyon.

Current Recovery Needs: Habitat protection, along with biological and ecological studies of the species and its habitat, need to continue.

Partnerships

Forest Service: The Forest Service is surveying potential habitat for primrose populations and reintroduction sites. Population monitoring and genetic studies also have been initiated by the Forest Service and the Utah Native Plant Society.

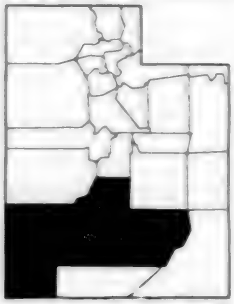
Utah Native Plant Society: The Society has mapped and annually monitors primrose populations.

State Arboretum of Utah (Center for Plant Conservation program): The Center has provided research on the biology and ecology of the species.

Recovery Plan Status: Plan approved 9/27/90.

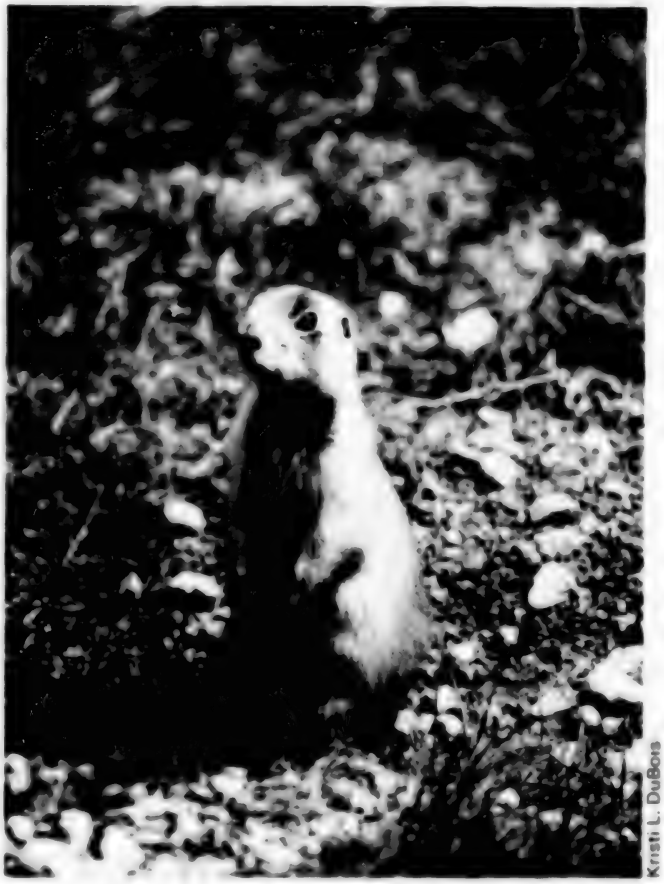
Utah Prairie Dog

(*Cynomys parvidens*)—Threatened



Current Status: Most Utah prairie dogs occur on private lands where they face threats from eradication programs. The species is also threatened by recurring plague outbreaks.

Achievements: The final amendment to a special rule expanding the authorized prairie dog control program was published in the June 14, 1991, *Federal Register*. This allows the Utah Division of Wildlife Resources to issue permits for eliminating up to 6,000 Utah prairie dogs per year on private lands throughout the species' range in order to reduce the effects of prairie dogs on private land. To further reduce conflicts, more than 1,300 prairie dogs were relocated in 1991 and 1992 from private lands into areas with existing colonies on Bureau of Land Management lands. A section 7 consultation with the Federal Highway Administration for proposed modifications to Interstate 15 in Cedar City resulted in a no-jeopardy biological opinion, and the Federal Highway Administration agreed to relocate prairie dogs from the construction site. A section 7 consultation was also completed with the Bureau of Land Management on a proposed transfer of lands to Garfield County. A no-jeopardy biological opinion was rendered after the Bureau of Land Management agreed to retain portions of the land that contained prairie dog colonies.



Kristi L. DuBois

Current Recovery Needs: Necessary recovery actions include relocating Utah prairie dogs from private lands into new and existing colonies on public lands, monitoring relocated colonies, conducting an annual census of spring breeding populations, and studying active colonies to determine which factors contribute to colony viability.

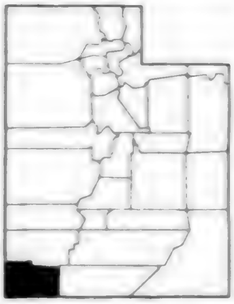
Section 6 Funding and Activities: The Utah Division of Wildlife Resources was provided $10,000 in FY 1992 to assist in relocating prairie dogs from private lands to public lands.

Partnerships

Bureau of Land Management: This Federal agency has identified and monitored Utah prairie dog populations on its lands and is assisting in the relocation of prairie dogs from private lands.

Utah Division of Wildlife Resources: The Utah Division of Wildlife Resources has conducted annual breeding censuses, which show population changes in the three prairie dog recovery areas, and has trapped prairie dogs on private lands for relocating into existing colonies on public lands.

Recovery Plan Status: Plan approved 9/30/91.



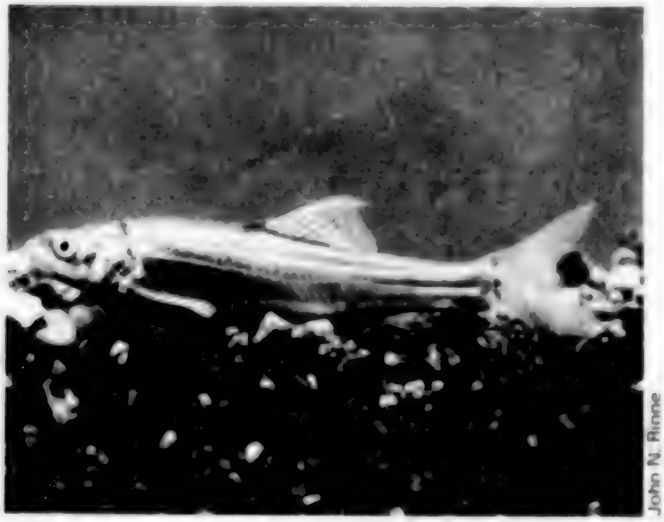
Woundfin

(Plagopterus argentissimus)—Endangered

Current Status: Threats to the woundfin include competition with, and predation by, nonnative fish species; water diversions; continued water development; and loss of habitat.

Achievements: Propagation techniques for the woundfin are being developed concurrently at the Dexter National Fish Hatchery and Technology Center, New Mexico; University of Nevada, Las Vegas; and Washington County Water Conservancy District and Utah Division of Wildlife Resources, St. George, Utah. Rearing ponds have been upgraded at the Dexter National Fish Hatchery and Technology Center to increase success in rearing the woundfin and other Virgin River fishes. Eradication of the nonnative redshiner from the Virgin River will begin as soon as plans are completed. The revised Virgin River Fishes Recovery Plan, which includes the woundfin, has undergone agency/public review. Informal section 7 consultations with the Federal Highway Administration on road and bridge construction resulted in outcomes allowing project completion without adverse impacts on woundfin populations.

Current Recovery Needs: Water flows to provide suitable habitat need to be acquired and protected, and nonnative fish species need to be eradicated from the Virgin River.



John N. Rinne

Section 6 Funding and Activities: The Utah Division of Wildlife Resources received $15,000 in FY 1991 and $36,000 in FY 1992 to monitor the status of Virgin River fishes, including the woundfin, and to develop and implement an eradication plan for the nonnative redshiner.

Partnerships

Bureau of Land Management: This Federal agency is studying streamflow needs of the woundfin and other components of the Virgin River ecosystem. The agency is participating on the woundfin recovery team, and is attempting to identify appropriate habitat conditions and required minimum flows for Virgin River fishes.

Utah Division of Wildlife Resources: Responsible for monitoring population status and trends of the woundfin, this State agency provides much of the monitoring data available to the Fish and Wildlife Service for the Virgin River Fishes Data Base. The agency is also completing a redshiner eradication plan, and has mapped the Utah portion of woundfin habitat, identifying priority areas for redshiner eradication.

Washington County Water Conservancy District: The District participates on the recovery team and in efforts to obtain water and improve habitat within the Virgin River Basin. The District has established a woundfin holding facility that will be used for holding and propagating woundfin during any future eradication efforts. The District has also provided barriers to prevent redshiners from invading areas where they presently do not occur.

Recovery Plan Status: Original plan approved 7/9/79; revised 3/1/85.

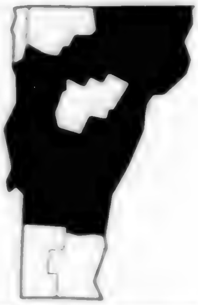
Vermont

Species Name	*Status*
Bat, Indiana	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Mussel, dwarf wedge	E
Beetle, Puritan tiger	T
Bulrush, northeastern (=barbed bristle)	E
Cinquefoil, Robbins'	E
Milk-vetch, Jesup's	E
Pogonia, small whorled	E

Vermont

Peregrine Falcon

(*Falco peregrinus*)—Endangered



Current Status: Rangewide threats to the species include human disturbance of nesting sites, habitat modification, and occasional incidence of poor productivity due to high levels of DDE (a breakdown product of the pesticide DDT) in eggshells.

Achievements: The nesting population of peregrines in Vermont continues to increase, with a record 8 pairs producing 17 young in 1992. Most young were banded in 1992 using a new color scheme developed to track the reestablished population.

Current Recovery Needs: Necessary recovery actions include continued surveys for new eyries, habitat protection, contaminant analysis, and public outreach.

Section 6 Funding and Activities: The Vermont Fish and Wildlife Department received $10,000 in both FY 1991 and FY 1992 for peregrine population monitoring, eyrie surveys, banding, and compilation of productivity data.

Partnerships

Forest Service: The Forest Service works to conserve peregrine habitat. At the Green Mountain National Forest, where an active eyrie is located, the Forest Service regulates human access and restricts logging, as necessary, to protect the nest.

Vermont Fish and Wildlife Department: The Department continues to conduct activities, such as searching for eyries, monitoring nesting pair activities, contacting landowners, and working with other State and Federal agencies and private organizations, for the peregrine's conservation and preservation.

Recovery Plan Status: Original plan approved 8/20/79; revised 9/27/91.

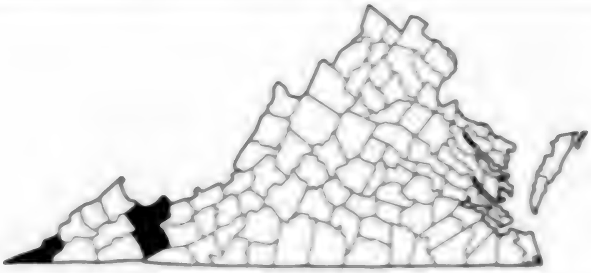
FWS File Photo

Virginia

Species Name	*Status*
Bat, gray	E
Bat, Indiana	E
Bat, Virginia big-eared	E
Shrew, Dismal Swamp southeastern	T
Squirrel, Delmarva Peninsula fox	E
Squirrel, Virginia northern flying	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	T
Woodpecker, red-cockaded	E
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, Kemp's (=Atlantic) ridley sea	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Salamander, Shenandoah	E
Chub, slender	T
Chub, spotfin	T
Logperch, Roanoke	E
Madtom, yellowfin	T
Snail, Virginia fringed mountain	E
Fanshell	E
Mussel, dwarf wedge	E
Pearly mussel, Appalachain monkeyface	E
Pearly mussel, birdwing	E
Pearly mussel, cracking	E
Pearly mussel, Cumberland bean	E
Pearly mussel, Cumberland monkeyface	E
Pearly mussel, dromedary	E
Pearly mussel, green-blossom	E
Pearly mussel, little-wing	E
Pearly mussel, pink mucket	E
Pigtoe, fine-rayed	E
Pigtoe, rough	E
Pigtoe, shiny	E
Riffle shell, tan	E
Spinymussel, James River (=Virginia)	E
Isopod, Madison Cave	T
Beetle, northeastern beach tiger	T
Birch, Virginia round-leaf	E
Bulrush, northeastern (=barbed bristle)	E
Joint-vetch, sensitive	T
Mallow, Peter's Mountain	E
Orchid, eastern prairie fringed	T
Pink, swamp	T
Pogonia, small whorled	E
Rock-cress, shale barren	E
Spiraea, Virginia	T

Little-wing Pearly Mussel

(*Pegias fabula*)—Endangered



Current Status: The little-wing pearly mussel faces water quality degradation resulting from industrial and sewage effluents and the runoff of silt and other water pollutants from poorly designed construction, development, mining, agricultural, and forestry activities. Further, the spread of the exotic zebra mussel (*Dreissena polymorpha*) represents a potential threat to the survival of this species. Zebra mussels outcompete native mussel fauna, and infestations in the water column can physically disrupt normal breeding and feeding behavior.

Achievements: Although little measurable progress has been made in establishing new mussel populations or in stabilizing existing populations, substantial recovery efforts for all the State's federally listed mussels are under way. Research is continuing on maintaining captive mussel populations, mussel cryopreservation, and potential impacts of the exotic zebra mussel on native mussels.

Current Recovery Needs: Recovery of the little-wing pearly mussel will require additional research to develop new propagation techniques, reintroduction into unoccupied historical habitat, and determination of the factors that are causing declines in the wild. Also, technology is needed for cryopreservation of freshwater mussel genetic material.

Dick Biggins

Section 6 Funding and Activities: The Virginia Department of Game and Inland Fisheries received $18,983 in FY 1991 and $30,716 in FY 1992 to assess the health of mussel and fish communities in upper Tennessee River tributaries and conduct mussel reintroduction research.

Partnerships

Virginia Department of Game and Inland Fisheries: Responsible for managing the State's mussel population and maintaining a geographic data base on mussel distribution, the Department provides valuable information on the distribution of federally listed mussels. Through its environmental review process and site surveys, the Department helps protect these species and has funded a study to develop techniques to maintain captive mussel populations. The agency is also developing a pilot project to educate residents living along an important mussel stream on the importance of protecting aquatic resources.

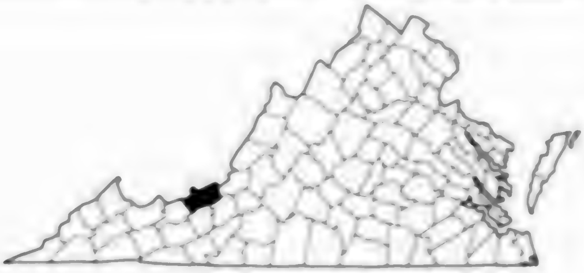
Virginia Department of Conservation and Recreation: This State agency is responsible for maintaining a geographic data base on mussel distribution and conducts surveys to identify the distribution and abundance of native mussels.

The Nature Conservancy: This private organization has an active land protection program in the upper Tennessee River system and an office that provides public education on the value of aquatic resources. The Conservancy works with government agencies to coordinate programs benefitting mussels and with landowners to protect riparian habitat.

Recovery Plan Status: Plan approved 9/22/89.

Peter's Mountain Mallow

(*Iliamna corei*)—Endangered



Current Status: This species is threatened by collecting, vandalism, competition with weedy species, and predation by insects and feral goats.

Achievements: Endemic to Virginia, this species is known from only one site, Peter's Mountain. When it was discovered in 1927, about 50 individuals existed; by 1986, when the species was listed, only 3 individuals remained, and these were not setting seed. Following Federal listing, botanists from Virginia Polytechnic Institute and State University found viable seeds in the leaf litter on Peter's Mountain and were able to germinate them. The Fish and Wildlife Service used these seedlings to establish a garden population that produced many more seeds, allowing study of the germination and seed set problems occurring in the natural population. Service research found that fire is necessary to stimulate germination. With the permission of The Nature Conservancy, which recently acquired the habitat, the Service conducted a small, carefully controlled burn at the population site in the spring of 1992. Since then, several mallow seedlings have germinated in the burned plots, dramatically improving the outlook for the species' survival.

Current Recovery Needs: The population on Peter's Mountain will need continued tending, including reducing competing vegetation, caging the plants to control browsing, and even watering the plants during prolonged droughts. Plants in the experimental gardens will also need maintenance, and when the ecology and fire history of the site have been evaluated, consideration should be given to establishing additional populations on Peter's Mountain.

Section 6 Funding and Activities: The Virginia Department of Agriculture and Consumer Services received $10,000 in FY 1991 and $6,000 in 1992 for site monitoring, germination studies, and experimental burning.

Partnerships

Forest Service: The Forest Service has participated in recovery meetings and provided technical assistance with controlled burns at the natural population site, which adjoins Jefferson National Forest.

Steve Croy

Virginia Department of Agriculture and Consumer Services: As the authorized State agency to manage rare plants, the Department provided funding for site monitoring conducted by botanists from Virginia Polytechnic Institute and State University.

The Nature Conservancy: This private organization acquired the natural population site on Peter's Mountain, thus providing protection for the species.

Recovery Plan Status: Plan approved 9/28/90.

Virginia

Virginia Round-leaf Birch

(*Betula uber*)—Endangered

Current Status: This species consists of 1 natural population and 20 introduced populations in the wild. Each introduced population had an original planting of 96 trees; the average survival rate after 5 to 8 years is 77 percent. Until successful reproduction takes place in both the natural and introduced populations, this species will remain threatened by disease and insect damage, drought, and herbivory. Threats of habitat loss and vandalism in portions of the natural population, which occurs on private lands, have been diminished through efforts to achieve landowner cooperation and public awareness.

Achievements: Although the natural population does not show signs of reproduction, many trees in the introduced populations flowered and produced fruit in 1992. The outlook for long-term maintenance of these populations is good. Many seedlings have been successfully propagated in a plant breeding facility, and these seedlings have been distributed to interested individuals. This practice appears to have alleviated the threat of collection, which had been a major concern. It has also helped to buffer the loss of genetic stock. The Fish and Wildlife Service is currently considering reclassification of this species from endangered to threatened status.

Current Recovery Needs: Populations on private lands will need continued protection, and all populations will need continued monitoring. Fencing of young trees in several of the introduced populations is needed to prevent loss from deer browsing. Public awareness programs should continue, and pathogens and insects affecting the birch should be investigated.

F. G. Meyer

Section 6 Funding and Activities: The Virginia Department of Agriculture and Consumer Services received $8,000 in both FY 1991 and FY 1992 for monitoring transplanted populations.

Partnerships

Forest Service: All introduced populations are under the purview of the Mount Rogers National Recreation Area within the Jefferson National Forest. The Forest Service has played a major role in monitoring and protecting these populations, and it maintains landowner contacts to protect the natural population. It also leads a recovery coordination committee, comprised of members from Federal and State agencies, as well as conservation organizations, universities, and the private sector.

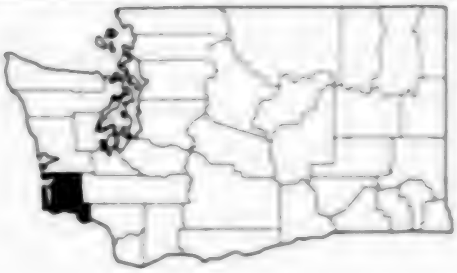
Virginia Agricultural Experiment Station and Virginia Department of Agriculture and Consumer Services: Working with the Virginia Department of Agriculture and Consumer Services, the Virginia Agricultural Experiment Station developed the program for distributing propagated seedlings. By making plants available to the public, the Department has improved awareness of endangered species and reduced vandalism to the natural populations. The Virginia Department of Agriculture and Consumer Services also monitors populations of this species.

Reynolds Homestead Research Center: This private organization cultivates seedlings of the Virginia round-leaf birch for transplanting and distributing to interested individuals. The Center planted over 100 genotypes of round-leaf birch, sweet birch, and bog birch in a 1-acre breeding orchard at the Center for research purposes.

Recovery Plan Status: Original plan approved 3/3/82; revised 9/24/90.

Washington

Species Name	*Status*
Bear, brown (=grizzly)	T
Caribou, woodland	E
Deer, Columbian white-tailed	E
Wolf, gray	E
Eagle, bald	T
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Goose, Aleutian Canada	T
Owl, northern spotted	T
Pelican, brown	E
Turtle, green sea	T
Turtle, leatherback sea	E
Turtle, olive (=Pacific) ridley sea	T
Butterfly, Oregon silverspot	T



Columbian White-tailed Deer

(Odocoileus virginianus leucurus)—Endangered

Washington Department of Natural Resources

Current Status: The major threat to the species is the loss of habitat, primarily to residential and agricultural development. Additional threats include predation from coyotes, illegal take, and disease. Some disease may result from high densities of deer in core areas.

Achievements: The Columbian white-tailed deer population in Washington has consistently increased since it was listed as endangered in 1967. The population that year was less than 400, but today it is estimated at 600 to 800. Major progress has been made in securing and managing habitat, including establishment of the Julia Butler Hanson National Wildlife Refuge along the Lower Columbia River for protecting the deer. The Fish and Wildlife Service is considering reclassifying the species from endangered to threatened, which should allow greater flexibility in herd management.

Current Recovery Needs: Although deer numbers are now above the numerical goals specified in the recovery plan for delisting, there is not yet enough secure habitat to ensure sustained recovery. Once adequate habitat has been secured, consideration can be given to delisting the species.

Partnerships

Washington Department of Wildlife: This State agency assists with population surveys, enforces hunting restrictions, provides landowners and counties with incentives to secure habitat, conducts research, and provides technical assistance to private landowners and State and Federal agencies. The agency has also helped in dealing with depredation problems.

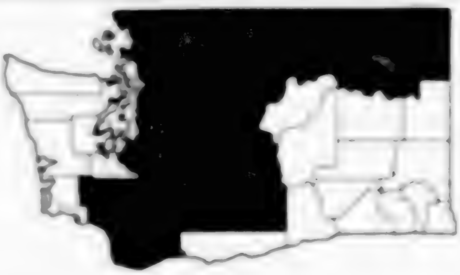
The Nature Conservancy: This private organization purchased habitat in the Lower Columbia River area for the deer and other riparian-dependent species.

Recovery Plan Status: Original plan approved 10/21/76; revised 6/14/83.

Washington

Gray Wolf

(Canis lupus)—Endangered



Current Status: Intensive human settlement, loss of habitat, conflicts with domestic livestock, lack of understanding of the wolf's ecology and habits, and superstition have had a major impact on the decline of the wolf and on its recovery.

Achievements: Since 1990, wolf denning has been documented in Washington, and wolves occurring there are no longer considered transients from British Columbia. The Interagency Gray Wolf Steering Committee, comprised of representatives from State and Federal conservation and land management agencies, is facilitating wolf conservation and management. To help control wolf depredations on livestock, the Fish and Wildlife Service has entered into a cooperative agreement with the Department of Agriculture's Animal Damage Control program, and a trapping permit has been issued. An interagency network of biologists has been established to investigate sightings and conduct surveys. A toll-free telephone number has been established to take calls from the public about wolf sightings, and dozens of sightings have been reported.

Numerous section 7 consultations have been completed on projects involving mining, logging, grazing, and road management. Conservation recommendations resulting from these consultations have focused on reducing road densities and maintaining an ungulate prey base for wolves.

Current Recovery Needs: A primary goal for the near future is completion of a recovery plan for the gray wolf in Washington. Continued intensive monitoring is also needed to gain information for managing and conserving the wolf.

Section 6 Funding and Activities: In both FY 1991 and FY 1992, the State of Washington received $135,000, primarily to conduct surveys and to gather the information necessary to develop a recovery plan and begin recovery activities.

Partnerships

Forest Service, National Park Service, Bureau of Land Management, and Bureau of Indian Affairs: These Federal agencies, along with the Fish and Wildlife Service and the Department of Agriculture, are taking an active role in wolf recovery and have representatives serving on the Interagency Gray Wolf Steering Committee. The wolf recovery plan for Washington, now under development, will detail any further responsibilities the agencies may have.

Department of Agriculture: The Department's Animal Damage Control program has signed a cooperative agreement with the Fish and Wildlife Service to help in the control of wolves that may feed on livestock. The Animal Damage Control program has also been issued a permit to trap problem wolves in Washington.

Washington Department of Wildlife: This State agency is conducting several major programs for the wolf, including surveys, collection of population and habitat use data, and education and information programs. Further responsibilities for this agency will be detailed in the recovery plan.

Wolf Haven, Washington Wool Growers Association, and Greater Ecosystems Alliance: These private groups have volunteered to assist in recovering the gray wolf in Washington. Thus far, private sector responsibilities have centered on information and education programs and input to the Interagency Gray Wolf Steering Committee. Wolf Haven and the Washington Wool Growers Association each have representatives serving on that committee. Greater Ecosystems Alliance held a symposium on wolf recovery in Seattle in early 1992.

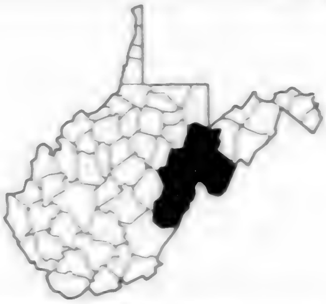
Recovery Plan Status: Plan under development.

FWS File Photo

West Virginia

Species Name	*Status*
Bat, Indiana	E
Bat, Virginia big-eared	E
Squirrel, Virginia northern flying	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Salamander, Cheat Mountain	T
Snail, flat-spired three-toothed	T
Fanshell	E
Mussel, ring pink (=golf stick pearly)	E
Pearly mussel, pink mucket	E
Pearly mussel, tubercled-blossom	E
Spinymussel, James River (=Virginia)	E
Bulrush, northeastern (=barbed bristle)	E
Clover, running buffalo	E
Harperella	E
Rock-cress, shale barren	E
Spiraea, Virginia	T

West Virginia



Cheat Mountain Salamander

(*Plethodon nettingi*)—Threatened

Mark Watson

Current Status: Most of the known populations of the Cheat Mountain salamander are small, and the species appears to be susceptible to relatively subtle changes in its environment, such as drought, reduction of the forest canopy by storms, and competition with other salamanders. Pollution factors such as acid precipitation may also affect the survival of the salamander.

Achievements: Searches have increased knowledge of the distribution and population status of this species. Although real numbers are probably not increasing, many of the 70 known populations exist on protected lands, primarily national forests. Biologists are searching for additional populations and monitoring known populations.

Section 7 consultations with the Forest Service have been very effective in providing protection to the salamander through movement or modification of proposed roads, trails, and timber sales. Standards and guidelines to protect the salamander, established by the Forest Service and approved by the State and the Fish and Wildlife Service, apply to any project that may affect occupied or potential salamander habitat. As part of this process, numerous areas of the Monongahela National Forest are being surveyed for salamanders.

Current Recovery Needs: Protecting populations on private lands remains a need. For populations on national forest lands, management prescriptions benefitting this species will need to be refined as more information about habitat requirements is obtained. Preservation of the salamander's microhabitat conditions (i.e., maintaining humidity and temperature conditions) is critical. Continued surveys and at least 9 years of additional monitoring are necessary to determine whether population trends and habitat conditions indicate long-term survival of this species in the wild.

Section 6 Funding and Activities: The West Virginia Division of Natural Resources received $5,000 in both FY 1991 and FY 1992 to conduct population monitoring and surveys.

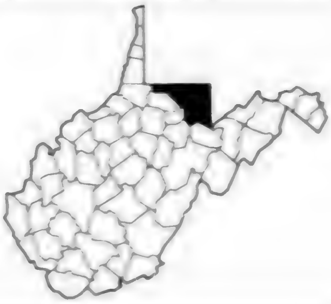
Partnerships

Forest Service: In accordance with its Monongahela National Forest Land and Resource Management Plan, the Forest Service has made conserving the Cheat Mountain salamander an integral part of the planning process, resulting in significant habitat identification and protection.

West Virginia Division of Natural Resources: Responsible for monitoring populations and protecting habitat, the Division has been instrumental in conducting surveys showing that the salamander is more abundant than originally thought. The State participates in section 7 consultations by providing information, and coordinating and cooperating with the Fish and Wildlife Service in determining the impacts of projects on the salamander.

Recovery Plan Status: Plan approved 7/25/91.

West Virginia



Flat-spired Three-toothed Snail

(*Triodopsis platysayoides*)—Threatened

Current Status: The species is restricted to isolated patches of deep leaf litter and sheltered retreats among sandstone boulders at a site in Cooper's Rock State Forest and similar rocky areas along the Cheat River Canyon. Visitors threaten this highly restricted species by trampling leaves that provide cover and feeding habitat and by discarding unextinguished cigarettes that pose a fire hazard.

Achievements: Known populations have increased from 7 in 1987 to 17 in 1992. Using snails produced from a captive breeding population, the West Virginia Division of Natural Resources reintroduced 140 half-grown snails into the Cooper's Rock State Forest. In addition, study of the captive population has produced important life history information including sexual maturity, reproduction rates, and longevity. A section 7 consultation with the Department of Agriculture on its Appalachian Integrated Pest Management program, which is administered to slow the spread of the gypsy moth, resulted in an agreement to not spray pesticides near any of the known or suspected snail populations.

Current Recovery Needs: Current recovery needs include constructing a fence around occupied habitat in Cooper's Rock State Forest, continuing to prohibit rock climbing in these areas, identifying suitable habitat and conducting population surveys in the Cheat River Canyon, and protecting snail sites on nearby lands.

Ken Knight

Section 6 Funding and Activities: The West Virginia Division of Natural Resources received $3,500 in FY 1991 and $2,500 in FY 1992 to survey for new populations near Cheat River Canyon.

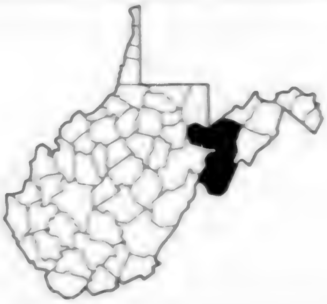
Partnerships

West Virginia Division of Natural Resources: This State agency has conducted surveys to locate new populations in the Cheat River Canyon and has contacted landowners to discuss protection options. The Division also has established a captive population, which has produced snails for reintroduction, as well as provided the opportunity to gain knowledge of the snail's life history. In addition, the Division has been instrumental in protecting the largest population of the snail, which occurs at Cooper's Rock State Forest, by limiting rock climbing and hiking in the area.

The Nature Conservancy: The Conservancy has contacted a private landowner about options for protecting five snail populations on his property.

Recovery Plan Status: Plan approved 5/9/93.

West Virginia



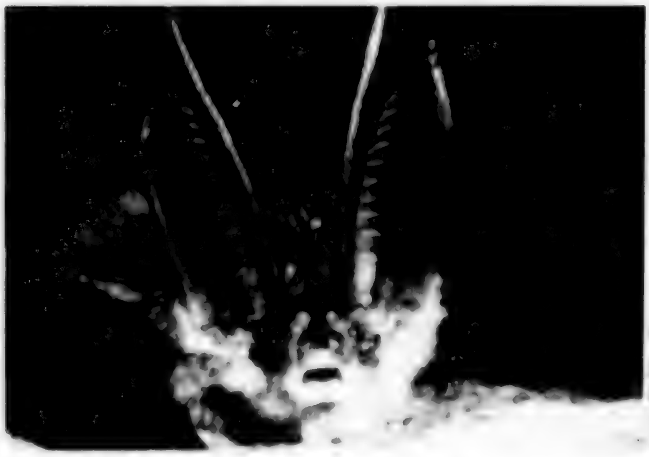
Virginia Big-eared Bat

(*Plecotus townsendii virginianus*)—Endangered

Current Status: Threats include disturbance of bat colonies from unauthorized entry into caves by recreationists and/or bat collectors, and continued susceptibility to extinction either from a single event (such as widespread pesticide spraying) or from the cumulative impacts of limestone mining and loss of foraging habitat.

Achievements: Known population levels have increased from 1,300 to more than 13,000 (winter counts) since the bat's listing in 1979. Steady increases in numbers over the last few years for both summer and winter colonies have been observed at most West Virginia caves. Discovery of additional hibernacula and maternity colonies has also contributed to higher known population levels. A new summer colony numbering approximately 1,350 bats, making it the largest known for the species, was discovered in 1992. Several caves have been gated to prevent human disturbance while the caves are occupied by bats. A brochure, pamphlets, and t-shirts featuring eastern bat species, including the Virginia big-eared bat, have been distributed.

Most of the formal section 7 consultations that have been conducted for the Virginia big-eared bat involved Forest Service activities in the Monongahela National Forest. Standards and guidelines to protect the bat, established by the Forest Service and approved by the Fish and Wildlife Service, apply to any project that may affect a bat cave or foraging habitat. One section 7 consultation was conducted with the West Virginia Division of Water Resources, the Environmental Protection Agency, and the Germany Valley Limestone Company regarding plans to quarry limestone in the vicinity of Hellhole Cave. It was resolved that the company would lessen its blasting magnitudes and direct future mining away from the cave.



John R. MacGregor

Current Recovery Needs: Necessary recovery actions include gaining long-term management authority, through conservation easements or fee acquisition, for unprotected caves containing significant summer and winter colonies; further searches for summer colonies to determine year-round distribution; delineation and adequate protection of foraging habitat; continued monitoring and protection of all known big-eared bat caves; and revision of the Virginia big-eared bat recovery plan.

Section 6 Funding and Activities: The West Virginia Division of Natural Resources received $11,500 in both FY 1991 and FY 1992 to conduct winter and summer colony counts, construct and maintain gates and fences, and conduct a foraging study to determine the bat's surface habitat requirements.

Partnerships

Forest Service: The Forest Service has played a role in habitat protection and monitoring activities, and has provided substantial resources to install and maintain gates at several bat caves in the Monongahela National Forest.

West Virginia Division of Natural Resources: This State agency has conducted annual bat surveys, coordinated a foraging study, and maintained contacts with private landowners (including the owner of the cave supporting the largest known hibernaculum) and caving groups, which enabled discovery of the largest known maternity colony.

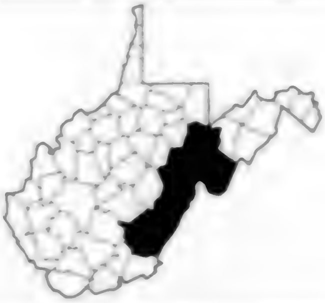
National Speleological Society: The Society has brought a number of bat caves to the attention of public agencies, including the most recent discovery of the largest known maternity colony. It also educates cavers to encourage protection of bat habitat.

Recovery Plan Status: Plan approved 5/8/84.

West Virginia

Virginia Northern Flying Squirrel

(*Glaucomys sabrinus fuscus*)—Endangered

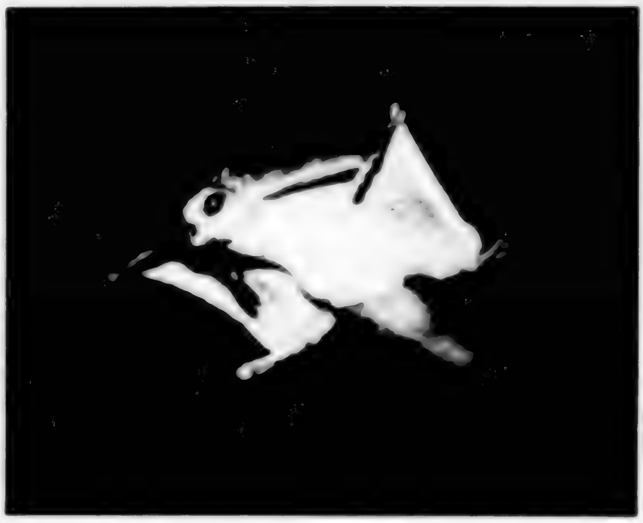


Current Status: Continuing threats to the squirrel include a possible loss in the quality of its remaining forest habitat due to introduced pest insects, deleterious effects on the squirrel's environment caused by pesticides used to control the insects, and die-offs of spruce and spruce-fir trees associated with acid precipitation and heavy metal pollution.

Achievements: Numerous captures at various locations show the subspecies to be more abundant than known at the time of listing. For instance, 17 new sites were discovered in 1992. The new captures indicated that several occupied habitats once thought to be disjunct are continuous. Northern flying squirrel habitat occurs primarily on national forests, and protection through the section 7 consultation process has been very effective. Standards and guidelines to protect the squirrel in the Monongahela National Forest were established by the Forest Service and approved by the Fish and Wildlife Service. In addition, after evaluating several types of projects, the Forest Service agreed to modify some timber sales. As a result of section 7 activities, five new squirrel sites were discovered in 1992.

Current Recovery Needs: Forest Service management prescriptions benefitting the squirrel need to be continued. The Fish and Wildlife Service is currently considering reclassifying the Virginia northern flying squirrel from endangered to threatened status. However, monitoring to confirm population stability or growth is needed.

Section 6 Funding and Activities: The West Virginia Division of Natural Resources received $8,000 in both FY 1991 and FY 1992 to monitor squirrels in the Monongahela National Forest. Two new sites were discovered in 1992 through activities undertaken with section 6 funds.



Nancy Wells

Partnerships

Forest Service: In accordance with its Monongahela National Forest Land and Resource Management Plan, the Forest Service has made protecting the northern flying squirrel an integral goal in its planning process, which has resulted in significant habitat identification and protection.

West Virginia Division of Natural Resources: This State agency has been instrumental in conducting a major monitoring study on the northern flying squirrel. Results have shown the squirrel to be more abundant than originally thought.

Recovery Plan Status: Plan approved 9/24/90.

Wisconsin

Species Name	*Status*
Bat, Indiana	E
Wolf, gray	E
Eagle, bald	T
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Plover, piping	E
Warbler (wood), Kirtland's	E
Mussel, winged mapleleaf	E
Pearly mussel, Higgins' eye	E
Bush-clover, prairie	T
Iris, dwarf lake	T
Locoweed, Fassett's	T
Monkshood, northern wild	T
Thistle, Pitcher's	T

Bald Eagle

(Haliaeetus leucocephalus)—Threatened

Current Status: Between 1990 and 1991, Wisconsin's bald eagle population grew dramatically in numbers of adult birds and active nesting territories. In 1991 and 1992, 414 active nests were known in the State, up from 358 in 1990. The number of young produced per nest is believed to be at or above the 1.0 level specified as a goal in the recovery plan. However, the amount of available habitat is decreasing because of resource extraction, construction, timber harvest, and highway expansion. Increased mortality and reduced productivity have been noted along the Great Lakes, probably the result of contaminants in prey. Additionally, eagles continue to suffer from electrocution, shooting, trapping, and intentional and accidental poisoning.

FWS File Photo

Achievements: The National Park Service, Forest Service, and Wisconsin Department of Natural Resources have been involved in identifying and protecting bald eagle nest sites, making eagle counts, and conducting public education activities.

Current Recovery Needs: Permanent protection for eagle habitat will be needed if the species is to achieve full recovery. Also, additional study of reduced reproduction along the Great Lakes is needed, along with steps to solve any problems found. Public education to explain the species' comeback should be increased, with emphasis on the need for continuing conservation. Illegal killing and harassment of bald eagles should be investigated and prosecuted.

Section 6 Funding and Activities: Wisconsin received $5,400 in FY 1991 for preparing wintering area management plans.

Partnerships

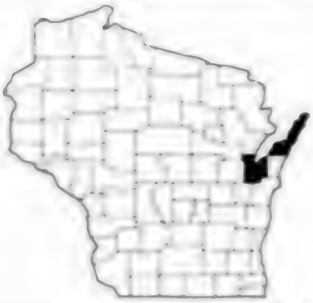
National Park Service and Forest Service: Both Federal agencies have incorporated bald eagle nest site identification, protection, and management activities into their land management plans. They also cooperate in eagle counts and public education activities.

Wisconsin Department of Natural Resources: In cooperation with Federal land management agencies, the Department conducts annual counts of bald eagle nest sites. The agency is also developing nest protection plans for all new nest sites, as well as guidelines for protecting and managing important bald eagle wintering areas. The "Adopt an Eagle Nest" program initiated by the Department has been highly successful in increasing public awareness of the eagle's status and has been a productive fund-raiser.

Recovery Plan Status: Plan approved 7/29/83.

Dwarf Lake Iris

(*Iris lacustris*)—Threatened



University of Michigan Matthaei Botanical Gardens

Current Status: Habitat destruction, often through road building and development, is a continuing threat. Collection of this attractive wildflower is also a problem.

Achievements: Substantial gains have been made for the dwarf lake iris and five other plant species (eastern prairie fringed orchid, Fassett's locoweed, northern wild monkshood, Pitcher's thistle, and prairie bush-clover) through a landowner identification and contact program conducted by the Fish and Wildlife Service and the Wisconsin Department of Natural Resources. Several hundred landowners have been contacted, and many have signed non-binding "Rare Plant Stewardship" protection agreements.

Current Recovery Needs: Although basic research is still required to determine the iris' life history, the main recovery need is protection of known plant populations from destruction and habitat degradation.

Partnerships

Environmental Protection Agency: The Wisconsin Department of Natural Resources received $91,614 from this Federal agency to continue and expand the landowner contact program for Wisconsin's six endangered and threatened plant species. The Environmental Protection Agency hopes to avoid adverse impacts to these species from herbicides regulated under its authority.

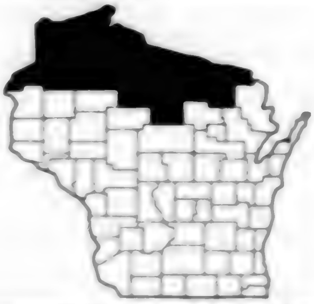
Wisconsin Department of Natural Resources: The landowner contact program and annual monitoring of dwarf lake iris populations are ongoing efforts being carried out by this State agency.

Recovery Plan Status: Technical draft plan.

Wisconsin

Gray Wolf

(Canis lupus)—Endangered



Current Status: The wolf population of northern Wisconsin continues to grow since the setback in the mid-1980s caused by an outbreak of canine parvovirus. The late-winter 1992 estimate was that the Wisconsin wolf population consisted of 40 to 50 wolves in 13 packs. At least five of these packs produced pups in 1992. Pup survival in 1992 looked better than in 1991, when mange seemed to be driving pup mortality above normal levels. At present, the chief threat to the species in Wisconsin is death from human-related causes, both intentional and accidental. Habitat loss and disease are other significant threats.

Achievements: The revised Eastern Timber Wolf Recovery Plan, completed in 1992, specifies a criterion for reclassifying the Wisconsin wolf population from endangered to the less critical category of threatened: 3 successive years with a late winter population of at least 80 wolves. The Wisconsin wolf population is making excellent progress toward meeting this goal, with an annual population increase of approximately 20 percent. As wolf numbers have increased, there have been several instances of predation on livestock. In all cases, the owners have been satisfied with financial compensation by the State and/or the relocation of the offending wolves to interior national forest lands. Due to concern that upgrading U.S. Highway 53 in northwestern Wisconsin could result in wolf deaths from collisions and could inhibit the critically important dispersal of wolves into recovery areas in Wisconsin and Michigan, the Fish and Wildlife Service carried out a formal section 7 consultation with the Federal Highway Administration. A no-jeopardy biological opinion was issued, but to minimize incidental take of wolves, a 3- to 5-year study on possible effects of the highway on wolves has been initiated.

L. David Mech

Current Recovery Needs: If the Wisconsin/Michigan wolf population receives continued protection from persecution, habitat loss, and disease, in time it can build its numbers to the full recovery goal of 100 animals over a 5-year period and meet the criteria for delisting.

Partnerships

Forest Service: The Forest Service is represented on the recovery team and was significantly involved in the revision of the Eastern Timber Wolf Recovery Plan. Nicolet and Chequamegon National Forests have habitat management goals and strategies to increase wolf populations on their lands. Staff of both national forests have become heavily involved in public education activities for the wolf. The Forest Service has contributed funding to assist the State's wolf monitoring activities.

Wisconsin Department of Natural Resources: The Department is the primary agency implementing wolf monitoring and research in Wisconsin. It is continuing its long-term study of wolf numbers, reproduction, habitat use, and movement throughout northern Wisconsin. Department personnel are also assisting Michigan biologists in monitoring wolves in adjacent Michigan counties. Much of the Department's work is funded by Federal agencies, including the Fish and Wildlife Service.

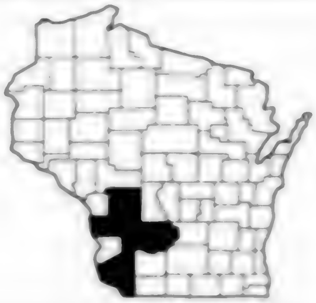
Timber Wolf Alliance and Timber Wolf Information Network: The Fish and Wildlife Service is working with these private organizations to improve public understanding of wolf biology, ecology, and recovery in Wisconsin and Michigan.

Recovery Plan Status: Original plan approved 6/5/78; revised 1/31/92.

Wisconsin

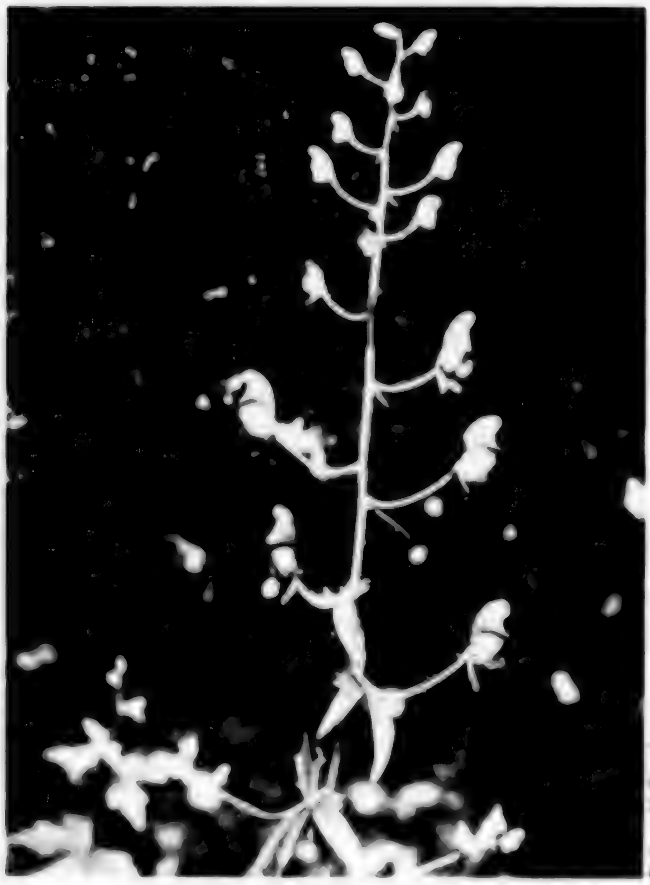
Northern Wild Monkshood

(*Aconitum noveboracense*)—Threatened



Current Status: Several significant populations occur along the Kickapoo River, where they remain threatened by an incomplete dam project near LaFarge. Although the Army Corps of Engineers ceased construction on the dam years ago, it never has been deauthorized. Its completion would inundate a number of the best northern wild monkshood populations in Wisconsin. Several other monkshood populations are on private land, where they are threatened by habitat destruction, as well as herbicides in agricultural use.

Achievements: Substantial gains have been made for this species, as well as five other plants (eastern prairie fringed orchid, Fassett's locoweed, dwarf lake iris, Pitcher's thistle, and prairie bush-clover), through a landowner identification and contact program conducted by the Fish and Wildlife Service and the Wisconsin Department of Natural Resources. Several hundred landowners have been contacted, and many have signed non-binding "Rare Plant Stewardship" protection agreements.



Robert H. Read

Current Recovery Needs: The larger populations of northern wild monkshood need permanent protection from habitat destruction or degradation, either through land purchases by a conservation group or management agreements developed with the landowner. Populations must be monitored to assess health.

Partnerships

Army Corps of Engineers: Protection of Kickapoo River monkshood populations from vandalism and collection are ongoing efforts being carried out by this Federal agency.

Environmental Protection Agency: The Wisconsin Department of Natural Resources received $91,614 from this Federal agency to continue and expand the landowner contact program for Wisconsin's six endangered and threatened plant species. The Environmental Protection Agency hopes to avoid adverse impacts to these species from herbicides regulated under its authority.

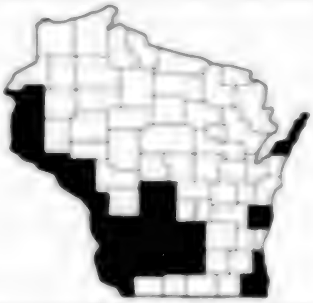
Wisconsin Department of Natural Resources: The landowner contact program is an ongoing effort being carried out by this State agency.

Recovery Plan Status: Plan approved 9/23/83.

Wisconsin

Peregrine Falcon

(*Falco peregrinus*)—Endangered



Current Status: Current trends indicate that the recovery goal of 20-25 breeding pairs in the Great Lakes Recovery Region may be reached in the next decade. Although there is concern that environmental contaminants could cause decreases in reproduction and increases in mortality, there is little evidence that such problems exist now. Predation on nestlings, fledglings, and adult falcons by great horned owls and raccoons has been significant at some historic eyries, making them unsuitable as hacking sites.

Achievements: Fifteen peregrine falcons were hacked in Wisconsin in 1991, and 41 were hacked in 1992. The State is considering ending its hacking program after 1993 because of the growing population of peregrines in the wild. One successful nesting occurred in Wisconsin in 1991, fledging four peregrines. In 1992, three successful nests fledged eight peregrines.

Current Recovery Needs: The peregrine falcon will need continued monitoring to detect any problems with contaminants, predation, and low genetic variability. Additionally, individual peregrines and their nest sites will need continued protection.

Partnerships

Wisconsin Department of Natural Resources: This State agency has taken the lead in organizing and funding peregrine hacking and monitoring activities in Wisconsin.

The Raptor Center at the University of Minnesota, St. Paul Campus: The Raptor Center has coordinated peregrine falcon reintroduction efforts in Wisconsin and throughout the Midwest. All peregrines for Wisconsin hacking programs are obtained by The Raptor Center; examined and treated by its veterinarians; and banded, released, and monitored by its staff and volunteers.

Recovery Plan Status: Original plan approved 8/20/79; revised 9/27/91.

FWS File Photo

Wyoming

Species Name	*Status*
Bear, brown (=grizzly)	T
Ferret, black-footed	E
Wolf, gray	E
Crane, whooping	E
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Toad, Wyoming	E
Dace, Kendall Warm Springs	E
Squawfish, Colorado	E
Sucker, razorback	E

Wyoming

Bald Eagle

(Haliaeetus leucocephalus)—Endangered

Current Status: Threats include loss of nesting habitat due to logging and subdivision for development, loss of wetland and riparian habitat, water pollution, nesting failures due to human disturbance of active nests, lead poisoning, secondary effects from illegal use of poisons for insect and predator control, and powerline electrocution.

Achievements: From 1980 to 1984, mid-winter bald eagle counts in Wyoming averaged 449 eagles annually. Since then, the method and frequency of surveys have shifted from population emphasis to trend counts; therefore, full-scale winter surveys are no longer made. However, winter surveys continue in key areas along established routes. In 1992, observers tallied 501 bald eagles on these routes. Bald eagle nesting continues to climb. In 1978, 20 bald eagle pairs attempting to nest were documented in Wyoming, with 13 young fledged. In 1991, 57 territories were checked; 52 were occupied, and 36 pairs were successful, fledging 51 young. These numbers include 40 territories in the Wyoming portion of the Greater Yellowstone Ecosystem, with 36 territories occupied and 23 pairs successful in fledging 31 young.

Current Recovery Needs: Recovery efforts should focus on preventing habitat loss from land development and logging, preserving riparian habitat and wetlands, providing more law enforcement, and continued monitoring.

Partnerships

Bureau of Land Management, Bureau of Reclamation, Forest Service, National Park Service, and Office of Surface Mining: These Federal agencies participate on the Bald Eagle Working Team for the Greater Yellowstone Ecosystem, assist in monitoring wild nest and roost sites, inventory habitat, and conduct public information and education programs. The Bureau of Land Management also assisted in population monitoring.

Paul W. Sykes, Jr.

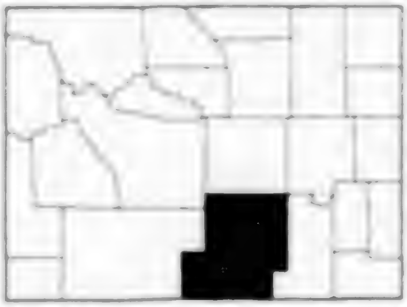
Wyoming Game and Fish Department: This State agency has a primary role in monitoring the bald eagle population and identifying and delineating habitats in Wyoming. The Department participates on the Bald Eagle Working Team. It works with private landowners and public agencies in managing and protecting nest sites.

Recovery Plan Status: Plan approved 4/12/82.

Wyoming

Black-footed Ferret

(*Mustela nigripes*)—Endangered



Current Status: The black-footed ferret preys almost exclusively on prairie dogs. Continued loss of prairie dog colonies, principally from poisoning, constitutes the greatest threat to the ferret. Poisoning degrades habitat and fragments what remains, making prairie dog colonies too small for ferret reintroduction. Very few sites have been identified as suitable for reintroduction, and the viability of those sites is uncertain.

Achievements: Since 1986 and 1987, when the 18 survivors of the last known wild black-footed ferret population were taken for captive breeding, the propagation program has exceeded all expectations. The captive population, distributed among an increasing number of facilities, has grown to more than 400 individuals. With sufficient young to support a sustained reintroduction effort, 49 ferrets were released into Wyoming's Shirley Basin in 1991. Summer 1992 surveys of the site revealed a minimum of four surviving adults, with two wild litters (six young). Successful reproduction during the first year of such a reintroduction program occurs only rarely, making the ferret a significant endangered species success story. Ninety additional ferrets will be reintroduced into Shirley Basin during fall 1992.

Since poisoning of prairie dogs is a significant threat to the ferret, most section 7 activities involve consultations with the Forest Service and the Bureau of Land Management on the use of rodenticides on private lands. The Fish and Wildlife Service recommends that private applicators conduct surveys for ferrets on sufficiently large prairie dog colonies prior to poisoning. Important section 7 consultations with the Forest Service regarding its management of the Thunder Basin National Grassland, a designated ferret reintroduction site, are under way. These consultations involve proposed oil and gas leasing and the Forest Service's proposed cessation of black-footed ferret surveys prior to prairie dog poisoning.

Current Recovery Needs: Agencies responsible for public lands need to develop prairie dog management plans that recognize and publicize the role of this animal as part of a balanced ecosystem. A continued effort to locate, develop, and properly manage ferret reintroduction sites also is needed.

Section 6 Funding and Activities: The Wyoming Game and Fish Department received $211,000 in FY 1991 and $140,000 in FY 1992 to support its ferret propagation and reintroduction programs.

Partnerships

Bureau of Land Management: The Bureau provides logistical and financial support for reintroduction efforts in the Shirley Basin.

Wyoming Game and Fish Department: The State provides personnel, logistical, and financial resources for ferret reintroduction. It also developed a protocol for releasing additional ferrets into Shirley Basin in 1992.

Henry Doorly Zoo (Nebraska), Louisville Zoo (Kentucky), Cheyenne Mountain Zoo (Colorado), Phoenix Zoo (Arizona), National Zoo Conservation and Research Center (Virginia), Metro-Toronto Zoo (Canada), and Sybille Research Center (Wyoming): These institutions house and breed captive ferrets. As of September 1992, 197 ferrets from the captive population were available for reintroduction.

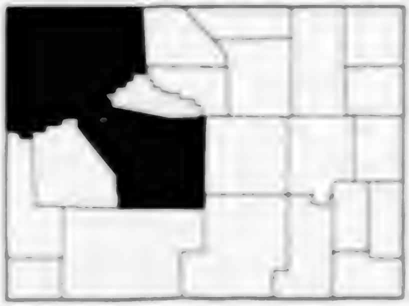
Recovery Plan Status: Original plan approved 6/14/78; revised 8/8/88.

Tim W. Clark

Wyoming

Grizzly Bear

(*Ursus arctos horribilis*)—Threatened



Current Status: Habitat loss, fragmentation, or degradation within and surrounding grizzly bear ecosystems constitute the major threat to the grizzly bear. The cumulative impacts of timber harvest, recreation, oil and gas activity, and associated road construction alter habitat and increase the opportunities for human/grizzly encounters. Quality low elevation habitat, including essential spring range, is often located on private lands with high potential for conflicts.

Achievements: Human-caused mortality of grizzly bears in the Yellowstone Grizzly Bear Ecosystem has decreased over the past decade due to interagency enforcement of sanitation regulations (e.g., closing of trash dumps), public education, habitat management, and nuisance bear control. The apparently stable population now numbers more than 200 in the Yellowstone Ecosystem. Responding to habitat management within the recovery zones, bears are reestablishing or increasing their use of habitat on Forest Service lands south of Yellowstone National Park.

An estimate of several thousand section 7 consultations with Federal agencies have occurred since 1990, most of them informal and resulting in slight modifications to some projects. The following agencies and projects have been involved: Forest Service (road building, logging, access permits, recreation, powerline construction, mining, oil and gas leasing, range programs); National Park Service (road building and maintenance, facility construction and maintenance, visitor use); Bureau of Land Management (mining, timber sales, special use permits, recreation management, noxious weed and insect control, animal damage control, land exchanges); and Animal Plant Health Inspection Service (animal damage control).

Current Recovery Needs: Recovery efforts include continued population monitoring in the Yellowstone Ecosystem, habitat conservation, interagency educational programs, cumulative effects analysis testing for habitat monitoring, and various sanitation projects.

Section 6 Funding and Activities: The Service provided $38,000 in FY 1991 and $38,000 in FY 1992 to the Wyoming Game and Fish Department to assist in gathering habitat and population data.

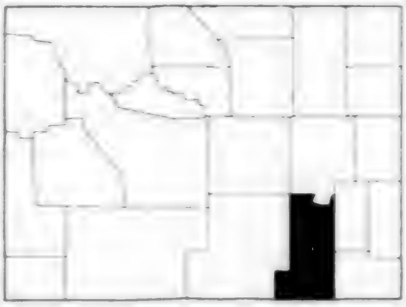
FWS File Photo

Partnerships

Forest Service, Bureau of Land Management, and National Park Service: In 1986, the Forest Service, Bureau of Land Management, National Park Service, and Wyoming Game and Fish Department authored the Interagency Grizzly Bear Guidelines (Guidelines) for acceptable population and habitat management. The Forest Service helps compile annual population monitoring records on forest lands. Habitat conservation measures include protection of essential bear habitat and mitigation to make multiple use objectives compatible with recovery. Educational programs and sanitation enforcement are reducing bear/human conflicts. Bureau of Land Management actions taken under the Guidelines conserve grizzly bear habitat, help make multiple use compatible with recovery, and decrease bear/human conflict. The National Park Service monitors the grizzly population in Yellowstone, manages nuisance bears, strives to make visitor use compatible with grizzly bear recovery and habitat conservation, and carries out educational programs and sanitation enforcement efforts that have significantly decreased bear/human conflict.

Wyoming Game and Fish Department: Responsible for nuisance bears on private, State, and Federal lands outside of national parks, this State agency has initiated educational programs and private lands efforts to reduce bear/human conflict. It employs a full-time biologist to coordinate bear management activities, research, and control actions.

Recovery Plan Status: Plan approved 1/29/82.



Wyoming Toad

(Bufo hemiophrys baxteri)—Endangered

Current Status: Though apparently holding its own, the wild population has suffered from the bacterial disease "redleg." Whether redleg is a natural condition or related to recent environmental changes remains unknown. The 6-year drought in the western United States has reduced the toad's wetland habitat as well as potential reintroduction sites.

Achievements: The only wild population of the Wyoming toad occurs at Mortenson Lake, purchased from The Nature Conservancy in 1992 for protection as the Mortenson Lake National Wildlife Refuge. The refuge's wild toad population numbers about 100, with another 60 in captivity. A second population was initiated at Lake George on the Hutton National Wildlife Refuge in the spring of 1992 with captive toads bred in cages at the site. Good reproduction resulted—four to five egg masses were produced—and good survival of young. Coordination with government agencies, local landowners, and mosquito control districts continues in order to protect these populations and to locate additional reintroduction sites. Studies begun in 1990 to evaluate contaminant issues found no significant problems, aside from possible impacts of mosquito control.

Current Recovery Needs: Continued population monitoring and maintenance, habitat protection and enhancement, research on redleg and other diseases, establishment of another captive population, and continued efforts to reestablish new populations are necessary.

Section 6 Funding and Activities: The Fish and Wildlife Service provided $20,000 in FY 1991 and again in FY 1992 to assist the Wyoming Game and Fish Department's captive breeding and disease identification efforts for the Wyoming toad.

P Stephen Corn

Partnerships

Wyoming Game and Fish Department: The Department is a joint partner in the recovery effort and maintenance of the captive population.

University of Wyoming: The University has monitored the wild toad population and managed habitat for the species.

The Nature Conservancy: The Conservancy bought and held land until the Fish and Wildlife Service could purchase it for the Mortenson Lake National Wildlife Refuge. It also has leased 20 acres adjacent to the refuge, which the Service proposes to purchase from the property owner in the future. The Conservancy is negotiating leases or conservation easements with other landowners for sites to reintroduce the species.

Recovery Plan Status: Plan approved 9/11/91.

Commonwealths, Territories, and District of Columbia

American Samoa

Species Name	*Status*
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Turtle, olive (=Pacific) ridley sea	T

District of Columbia

Species Name	*Status*
Eagle, bald	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Amphipod, Hay's Spring	E

Guam

Species Name	*Status*
Bat, little Mariana fruit	E
Bat, Mariana fruit	E
Broadbill, Guam	E
Crow, Mariana	E
Kingfisher, Guam Micronesian	E
Moorhen (=gallinule), Mariana common	E
Rail, Guam	E
Swiftlet, Mariana gray (Vanikoro)	E
White-eye, bridled	E
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Turtle, olive (=Pacific) ridley sea	T
Lagu, Hayun (Guam), Tron Kon guafi (Rota)	E

Commonwealth of the Northern Mariana Islands

Species Name	*Status*
Crow, Mariana	E
Mallard, Mariana	E
Monarch, Tinian (old world flycatcher)	T
Moorhen (=gallinule), Mariana common	E
Swiftlet, Mariana gray (Vanikoro)	E
Warbler (old world), nightingale reed	E
Turtle, olive (=Pacific) ridley sea	T
Lagu, Hayun (Guam), Tron Kon guafi (Rota)	E

Puerto Rico

Species Name	*Status*
Manatee, West Indian (=Florida)	E
Blackbird, yellow-shouldered	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Nightjar (=whip-poor-will), Puerto Rican	E
Parrot, Puerto Rican	E
Pelican, brown	E
Pigeon, Puerto Rican plain	E
Tern, roseate	T
Anole, Culebra Island giant	E
Boa, Mona	T
Boa, Puerto Rican	E
Boa, Virgin Islands tree	E
Gecko, Monito	E
Iguana, Mona ground	T
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Coqui, golden	T
Toad, Puerto Rican crested	T
Bariaco	E
Boxwood, Vahl's	E
Capa rosa	E
Cassia mirabilis (=Sci. name)	E
Cobana negra	T
Cranichis ricartii (=Sci. name)	E
Daphnopsis hellerana (=Sci. name)	E
Erubia	E
Fern, elfin tree	E
Goetzea, beautiful (matabuey)	E
Higo chumbo	T
Higuero de Sierra	E
Holly, Cook's	E
Ilex sintenisii (=Sci. name)	E
Lepanthes eltorensis (=Sci. name)	E
Palma de manaca	T
Palo colorado	E
Palo de jazmin	E
Palo de Nigua	E
Palo de Ramon	E
Palo de rosa	E
Pelos del diablo	E
Peperomia, Wheeler's	E
Prickly-ash, St. Thomas	E
Schoepfia arenaria (=Sci. name)	E
Ternstroemia subsessilis (=Sci. name)	E

Species Name	*Status*
Virgin Islands	
Manatee, West Indian (=Florida)	E
Falcon, American peregrine	E
Falcon, Arctic peregrine	T
Pelican, brown	E
Tern, roseate	T
Boa, Virgin Islands tree	E
Lizard, St. Croix ground	E
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Toad, Puerto Rican crested	T
Prickly-ash, St. Thomas	E

Species Name	*Status*
Palau (Trust)	
Megapode, Micronesian (=La Perouse's)	E
Crocodile, saltwater (=estuarine)	E
Turtle, green sea	T
Turtle, hawksbill sea (=carey)	E
Turtle, leatherback sea	E
Turtle, loggerhead sea	T
Turtle, olive (=Pacific) ridley sea	T

Puerto Rico

Leatherback Sea Turtle

(*Dermochelys coriacea*)—Endangered

Current Status: Adverse impacts from coastal development and poaching continue to threaten the leatherback sea turtle in Puerto Rico.

Achievements: Monitoring of nesting beaches and relocation of nests are being conducted cooperatively by the Fish and Wildlife Service, Puerto Rico Department of Natural Resources, University of Puerto Rico, and Earthwatch. The Puerto Rico Department of Natural Resources has a hatchery project for the turtle, and patrols beaches at Vieques, Humacao, and Pinones. Additionally, the Puerto Rico Department of Natural Resources is making efforts to acquire and protect the coastal area adjacent to a leatherback nesting beach near Fajardo.

Current Recovery Needs: Continuing recovery needs include beach patrolling and nest relocation when necessary. Additionally, both the Fish and Wildlife Service and the Puerto Rico Department of Natural Resources will need to continue to protect the species through law enforcement activities.

Section 6 Funding and Activities: The Puerto Rico Department of Natural Resources received $12,000 in FY 1991 and $10,000 in FY 1992 for beach patrolling and the turtle hatchery program.

Tony Tucker

Partnerships

Department of the Navy: The Navy assists the Puerto Rico Department of Natural Resources with the hatchery program and beach patrols.

Puerto Rico Department of Natural Resources: This State agency has programs to protect turtle habitat, patrol nesting beaches, and maintain its turtle hatchery program.

University of Puerto Rico: This university participates in the monitoring of nesting beaches and relocation of nests.

Earthwatch: This private organization is providing support for the leatherback sea turtle nesting project at Culebra Island, Puerto Rico.

Chelonia Society: Another private organization, the Chelonia Society, is providing education on the turtle and protection of turtle habitat.

Recovery Plan Status: Original plan approved 10/23/81; revised 4/6/92.

Puerto Rico

Puerto Rican Crested Toad

(*Peltophryne lemur*)—Threatened

Current Status: Breeding areas, which are seasonal ponds, and other toad habitat, such as limestone hills, are being eliminated by residential and tourist development.

Achievements: The Puerto Rican crested toad is being bred in captivity at the Toronto Zoo. The species has also been distributed to several zoos in the United States for captive breeding. Toad populations from the northern portion of Puerto Rico are being bred separately from those in the southern portion because these populations may be genetically distinct. Several releases of captive-bred toads have been made in both the northern and southern portions of the island. With the University of Puerto Rico at Humacao, the Puerto Rico Department of Natural Resources has initiated a captive breeding program and has constructed artificial ponds. Additionally, the Puerto Rico Department of Natural Resources is taking steps to protect breeding areas of the southern population. In partnership, the Puerto Rico Conservation Trust and the Puerto Rico Department of Natural Resources have purchased land to protect the toad and other endangered species.

Current Recovery Needs: The primary needs for recovery continue to be captive breeding programs and habitat protection.

Section 6 Funding and Activities: In FY 1991, the Puerto Rico Department of Natural Resources was given $7,000 for use in characterizing the toad's breeding habitat.

Partnerships

Puerto Rico Department of Natural Resources: This Puerto Rican government agency provides protection for the toad, has characterized its habitat, conducts a captive breeding program, and manages breeding habitat in the Guánica Commonwealth Forest. It was also a partner with the Puerto Rico Conservation Trust in the acquisition of Punta Ballena, adjacent to the Guánica Commonwealth Forest, to protect it from development.

Paul Gertler

Puerto Rico Conservation Trust: In the above mentioned partnership, the Puerto Rico Conservation Trust helped acquire Punta Ballena.

Toronto Zoo: The zoo is conducting a captive breeding program, and has conducted a monitoring program, using transmitters, that successfully tracked released toads.

University of Puerto Rico at Humacao: The University also has an ongoing captive breeding program for the toad.

Recovery Plan Status: Plan approved 8/7/92.

Puerto Rico

Puerto Rican Plain Pigeon

(*Columba inornata wetmorei*)—Endangered

Current Status: Threats to the Puerto Rican plain pigeon include destruction and modification of habitat in the Cidra area, which is the last existing natural refugia for this species. Additionally, accidental and intentional shootings continue to occur.

Achievements: The captive breeding program for the Puerto Rican plain pigeon has been successful. At present, 127 pigeons are being held in captivity, and a release of 10 in the Cidra area is planned for January 1993. These birds are being held in new captive breeding facilities. The Puerto Rico Department of Natural Resources is currently studying the pigeon and its habitat to determine which areas the species uses for breeding, roosting, and feeding, and to identify areas essential to its recovery.

Current Recovery Needs: The Fish and Wildlife Service is currently active in discussing with private landowner associations and Commonwealth natural resource agencies the concept of a Habitat Conservation Plan for the Cidra area to protect remaining nesting, roosting, and foraging areas. Recovery needs include captive breeding and monitoring of wild populations. Additional areas for release of captive birds are needed. The Puerto Rico Department of Natural Resources will continue to regulate hunting to avoid accidental and intentional shootings.

James W. Wiley

Section 6 Funding and Activities: The Puerto Rico Department of Natural Resources received $65,000 in both FY 1991 and FY 1992 to operate its captive breeding program.

Partnerships

Puerto Rico Department of Natural Resources: The Department continues a captive breeding program and conducts studies to determine the species' recovery needs.

Puerto Rican Plain Pigeon Foundation: Recently formed, this group participates in public education and habitat protection.

Recovery Plan Status: Plan approved 10/14/82.

Puerto Rico

Puerto Rico Commonwealth Forest Plants

Species:
Vahl's Boxwood (*Buxus vahlii*)—Endangered
Higuero de Sierra (*Crescentia portoricensis*)—Endangered
Palo de Rosa (*Ottoschulzia rhodoxylon*)—Endangered
Beautiful Goetzea (*Goetzea elegans*)—Endangered

Current Status: Primary threats to these species include habitat destruction and modification.

Achievements: A 1991 agreement between the Fish and Wildlife Service and the University of Puerto Rico initiated research on the distribution, abundance, propagation, and reproductive biology of the four endangered forest plants. New populations of Higuero de Sierra and palo de rosa have been discovered, while propagation has been successful for others, making possible the transfer of plants to the Puerto Rico Department of Natural Resources for planting in a Commonwealth Forest. Another agreement with the Service helped the Puerto Rico Department of Natural Resources build greenhouse facilities for endangered plant propagation and prepare to build two more in 1992. The Puerto Rico Department of Natural Resources and the Service also worked to protect a Vahl's boxwood population facing damage from the extraction of fill material for residential development. The developer agreed to set back the development limit to avoid affecting the plants. Finally, a Habitat Conservation Plan for the Puerto Rican tree boa and the crested toad includes mechanisms for protection of palo de rosa and other listed plant species.

David Densmore

Higuero de Sierra (*Crescentia portoricensis*)

Current Recovery Needs: Recovery activities will continue to include research and propagation. Habitat protection through the development of landowner agreements and land acquisition also is needed.

Section 6 Funding and Activities: FY 1992 funds totalling $10,600 will be used to construct two greenhouses at Guánica and Mariaco Commonwealth Forests.

Partnerships

Puerto Rico Department of Natural Resources: Listed under local regulations as well as the Endangered Species Act, these four forest plants figure in the Department's evaluation of all development projects. The Department has supported greenhouse construction for plant propagation.

University of Puerto Rico at Mayaguez: The University's Biology Department has conducted research on the species' life history, and has propagated plants for distribution.

Puerto Rico Conservation Trust: The Trust has planted endangered plants on its properties.

Fairchild Tropical Garden: This Florida partner has successfully propagated several species, planting some at the Garden and returning others to their native environment.

Recovery Plan Status:

Vahl's boxwood—plan approved 4/28/87.

Higuero de Sierra—plan approved 9/23/91.

Palo de rosa—no approved plan.

Beautiful goetzea—plan approved 4/28/87.

Puerto Rico

Virgin Islands Tree Boa

(*Epicrates monensis granti*)—Endangered

Thomas Schmidt

Current Status: Predation by nonnative rats, as well as habitat modification and destruction, threaten the tree boa.

Achievements: The Virgin Islands tree boa has been bred successfully in captivity at the Toledo Zoo. Also, additional populations recently have been found on mainland Puerto Rico in Luquillo and Cayo Diablo and on the nearby island of Culebra. The successful elimination of rats on Cayo Ratones, Puerto Rico, has prepared the way for releases of captive bred tree boas in the near future.

Current Recovery Needs: Protection of habitat, captive propagation, and predator control are primary needs.

Partnerships

Puerto Rico Department of Natural Resources: The Department is cooperating on rat control with the Toledo Zoo and Virgin Islands Department of Planning and Natural Resources, Division of Fish and Wildlife.

Toledo Zoo: In cooperation with the American Association of Zoological Parks and Aquariums, the Toledo Zoo's captive breeding program has resulted in more than 100 additional boas.

Recovery Plan Status: Plan approved 3/27/86.

Puerto Rico

West Indian Manatee

(*Trichechus manatus*)—Endangered

Current Status: Threats to the species include increasing risk of boat strikes because of the increasing numbers of recreational boaters, and destruction and modification of manatee habitat.

Achievements: The manatee is receiving increased protection from several sources. The Fish and Wildlife Service initiated a project using satellite telemetry to study manatee movements and habitat use in eastern Puerto Rico. The Service is also conducting quarterly aerial surveys to monitor habitat use and abundance. A recently formed non-profit group, the Caribbean Stranding Network, assists the Puerto Rico Department of Natural Resources and the Service in conducting salvage and rescue of manatees and other marine life (sea turtles, marine mammals, shorebirds). The Caribbean Stranding Network also assists in determining the causes of death for these species. Education about the manatee is conducted at local universities by the Service, Puerto Rico Conservation Foundation, and Caribbean Stranding Network. Formal section 7 consultations on manatees have resulted in jeopardy opinions for marinas on the southeast and south coast of Puerto Rico.

Current Recovery Needs: The work of the Caribbean Stranding Network will continue to be needed, as well as monitoring of the manatee population and protection of its habitat.

Section 6 Funding and Activities: In FY 1992, the Puerto Rico Department of Natural Resources received $5,000 for aerial surveys to monitor the manatee.

Partnerships

Department of the Navy: One of the largest concentrations of manatees occurs in the waters adjacent to the Roosevelt Roads Naval Station. The Navy is requesting funds to construct a lookout, and has funded Service studies of habitat use.

Puerto Rico Department of Natural Resources: To protect the manatee, this agency reviews development projects, conducts education activities and, through its Ranger Corps, regulates boating activities.

Galen Rathbun

Puerto Rico Conservation Foundation: This organization conducts education activities on the manatee through local universities.

Caribbean Stranding Network: This private organization conducts salvage and rescue work as needed and determines causes of deaths. With financial assistance from the Fish and Wildlife Service, private donors, and other agencies, the Network is caring for a young manatee that became separated from its mother.

Chelonia Society: This private organization routinely participates in educational activities and posts manatee awareness signs.

Recovery Plan Status: Plan approved 12/24/86.

Puerto Rico

Yellow-shouldered Blackbird

(*Agelaius xanthomus*)—Endangered

Current Status: Threats to the yellow-shouldered blackbird include the loss of its upland nesting habitat for residential and tourist development, encroachments by illegal houses and houseboats in mangrove areas, and nest parasitism by the shiny cowbird.

Achievements: Cowbird trapping, installation of nest structures, predator control, and habitat protection have increased the blackbird's reproductive success. The 1992 nesting season produced a record 257 fledglings, with regular roost counts indicating a stable or possibly increasing population. The small Roosevelt Roads Naval Station blackbird population in eastern Puerto Rico was hit by Hurricane Hugo, but other populations have been located near Jobos Bay and Salinas in the south-central part of the island, adding strength to blackbird numbers. In addition, formal section 7 consultations with the Army Corps of Engineers resulted in a jeopardy opinion regarding houseboats on off-shore cays in Parguera. Formal consultations with the Corps also determined that a Guánica residential development and a Montalva Bay marina would adversely modify critical habitat. Finally, the Fish and Wildlife Service worked with a landowner subdividing a large farm to ensure that forested areas identified as blackbird habitat would be left intact, and that the farms sold would be maintained for agricultural purposes. These restrictions were to be included on deeds of sale.

Current Recovery Needs: Continued monitoring of blackbird populations, habitat protection, and cowbird trapping are needed.

Section 6 Funding and Activities: The Puerto Rico Department of Natural Resources received \$53,000 in FY 1991 and \$57,000 in FY 1992 to conduct a cowbird control program, install and monitor artificial nest structures, and monitor the blackbird's reproductive success.

Partnerships

Department of the Navy: An agreement between the Navy and the Fish and Wildlife Service has led to routine consultations on projects within a designated area of the Roosevelt Roads Naval Station as well as assistance with blackbird surveys. This cooperative effort is in the beginning stages.

Puerto Rico Department of Natural Resources: The Department conducts a cowbird control program and monitors the blackbird's status. Specific activities include cowbird trapping, installation of nest structures, and predator control.

Recovery Plan Status: Plan approved 5/25/83.

Fernando Nunez

Leatherback Sea Turtle

(*Dermochelys coriacea*)—Endangered

Current Status: The leatherback sea turtle continues to be threatened by development on its sandy beach nesting habitat and poaching of adults and eggs.

Achievements: Nesting beaches, including those on Sandy Point National Wildlife Refuge, at Sandy Point, St. Croix, are being monitored and nests are relocated when necessary. These projects are being conducted by the Fish and Wildlife Service, National Park Service, Virgin Islands Division of Fish and Wildlife, and Earthwatch. Sandy Point had a record year for nesting leatherback turtles in 1992. A total of 360 nests were made by 55 females, producing an estimated 17,500 hatchling turtles.

Current Recovery Needs: Recovery will require continued beach patrolling, law enforcement, and, when necessary, nest relocation.

FWS File Photo

Section 6 Funding and Activities: The Virgin Islands Division of Fish and Wildlife received $35,000 in both FY 1991 and FY 1992 to continue conservation efforts.

Partnerships

National Park Service: This Federal agency protects sea turtle habitat and patrols the beaches used by sea turtles for nesting.

Virgin Islands Division of Fish and Wildlife: This agency protects sea turtle habitat and patrols the beaches used by sea turtles for nesting.

Earthwatch: This private organization organizes groups that help monitor the beaches and, when necessary, relocate nests.

Recovery Plan Status: Original plan approved 10/23/81; revised 4/6/92.

U.S. Virgin Islands

Virgin Islands Tree Boa

(*Epicrates monensis granti*)—Endangered

Peter J. Tolson

Current Status: Predation by nonnative rats, as well as habitat modification and destruction, threaten the tree boa.

Achievements: The Virgin Islands tree boa has been bred successfully in captivity at the Toledo Zoo. Also, additional populations have been found on mainland Puerto Rico in Luquillo and Cayo Diablo and on the nearby island of Culebra. The successful elimination of rats on Congo Cay, U.S. Virgin Islands, has prepared the way for releases of captive bred tree boas in the near future. Recommendations to protect potential boa habitat, including conservation easements and zones, have been made as a result of section 7 consultations between the Fish and Wildlife Service and the Department of the Interior's Office of Territorial Affairs about the sale of Water Island to private interests. The consultation is continuing.

Current Recovery Needs: Protection of habitat, captive propagation, and predator control are primary needs.

Partnerships

Virgin Islands Department of Planning and Natural Resources, Division of Fish and Wildlife: The Department recently passed a local law protecting threatened and endangered species, thus providing opportunity to consider the boa when reviewing development projects. Also, it is cooperating on rat control with the Toledo Zoo and the Puerto Rico Department of Natural Resources.

Toledo Zoo: In cooperation with the American Association of Zoological Parks and Aquariums, the Toledo Zoo's captive breeding program has resulted in more than 100 additional boas.

Recovery Plan Status: Plan approved 3/27/86.

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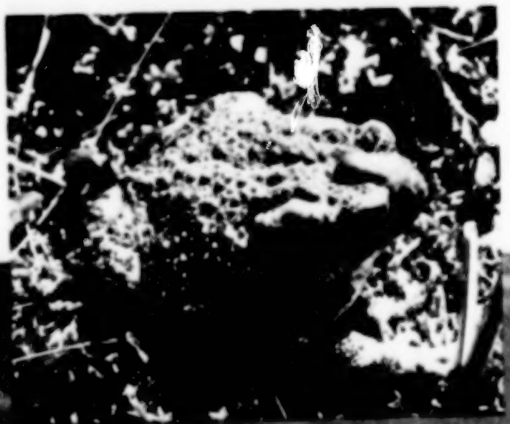

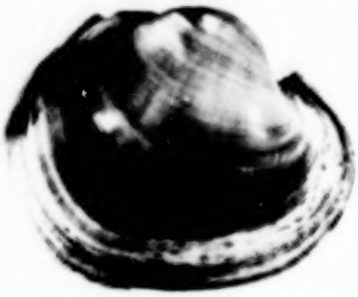

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